THE CAVALRY JOURNAL

"The strife is o'er,
The battle done;"

JANUARY-FEBRUARY, 1946

The Cavalry Journal Plans to Reissue Chamberlin's Books on Horsemanship

The Cavalry Journal is negotiating for the publication rights of the two classical books on horsemanship by the late General Harry D. Chamberlin, which have been out of print for some time: *Riding and Schooling Horses,* and *Training Hunters, Jumpers, and Hacks.*

These two books have been in constantly growing demand by horsemen all over the country. In order to judge the advisability of republishing these two books, The Cavalry Journal would like to hear from those readers interested in purchasing new editions.

Riding and Schooling Horses runs to about 220 pages with index, and contains about 60 sparkling photographs and drawings illustrating every detail of the text. *Training Hunters, Jumpers, and Hacks* runs about the same size. We plan to issue books at about $4.00 each.

The printing will be limited, so if you are interested, please send us a post card indicating your desire to buy either one or both of these superb books. The next Cavalry Journal will contain full details of price, etc.

But don't forget: our plans to republish these books will depend entirely on the reception our readers give the idea, so write us at once.

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Organized November 9, 1885

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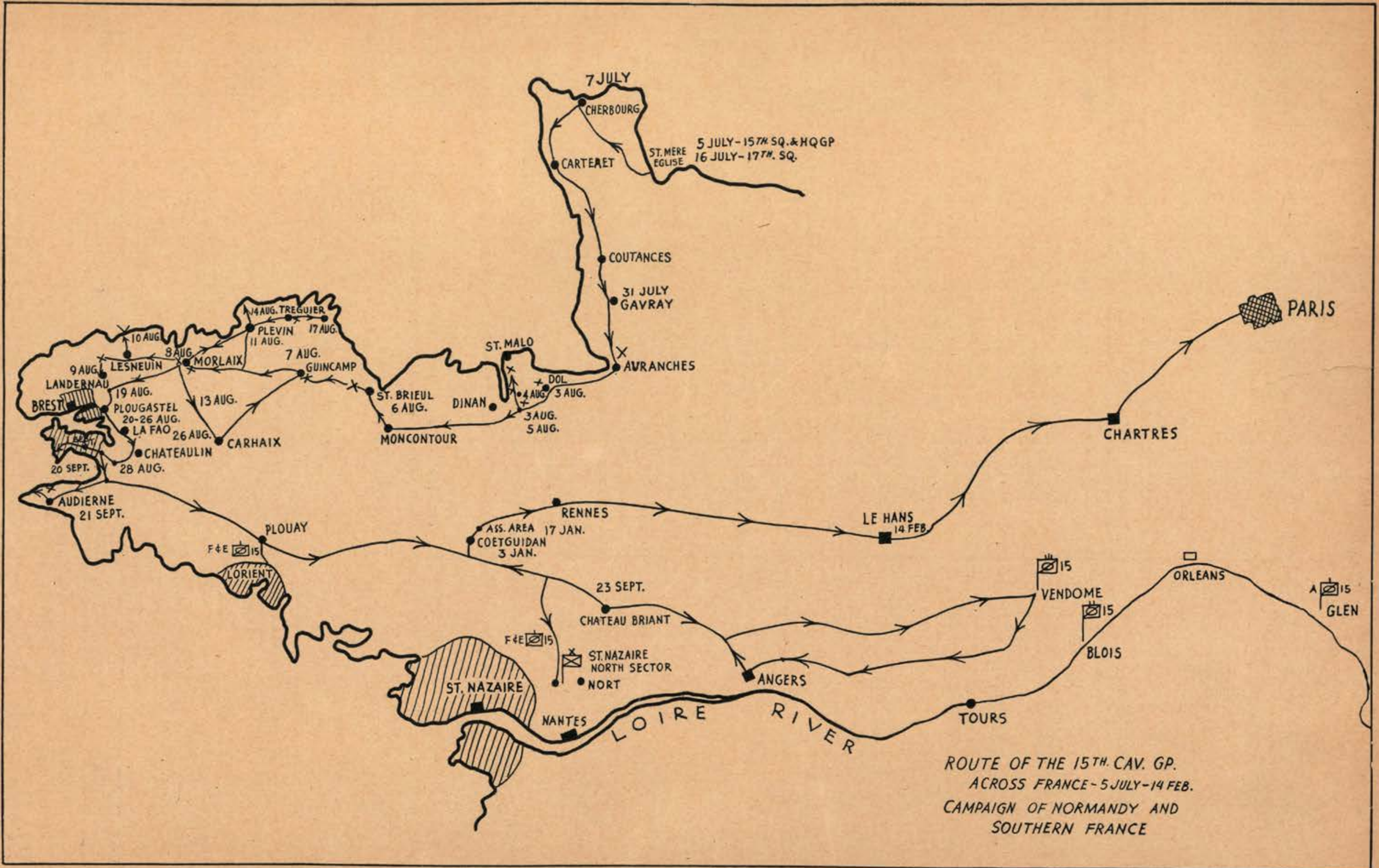
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ROUTE OF THE 15TH. CAV. GP.
ACROSS FRANCE - 5 JULY - 14 FEB.
CAMPAIGN OF NORMANDY AND
SOUTHERN FRANCE

15th CAVALRY GROUP

CONCLUSION

Assault Guns in Defensive Action

by Captain Edwin E. Lassen

FROM October, 1944, to February, 1945, the 17th Cavalry Reconnaissance Squadron was engaged in an entirely defensive rôle with the Ninth Army. From the beginning, Troop E (assault guns) directly supported the squadron with indirect fire, except on a few occasions when German positions were too close for such fire.

During the last week in October, the 17th Squadron was attached to the 113th Cavalry Group, then on the left of the Ninth Army. Troop E of the 17th Squadron relieved Troop E of the 125th and took over its positions. Both the Germans and our own troops were engaged in intensive patrolling, and defensive firing had to be closely coördinated with the troops.

The targets fired upon were numerous, and included enemy engaged in digging new positions, German patrols, harassing missions, and static defensive positions. The guns had been registered on likely avenues of approach, and the data recorded so that fire could be quickly laid. Guns were fired daily on check points to determine any change required in the firing data because of weather changes or gun movements.

When the squadron relieved elements of the 120th Regiment, Troop E was attached to the FA battalion of the 30th Division, and went into position at Frenhoven, some 3,000 yards from the front lines, where it handled all fire missions for the 17th Squadron. This attachment increased the battalion's fire power from 12 to 16 guns, and the battalion's data on troop positions enabled the combination to produce more effective fire.

There was such a severe shortage of artillery ammunition, especially 105mm and 155mm, that the battalions were limited to approximately three rounds per gun per day. Ammunition for 75mms was never limited, however, and the FA battalion employed assault guns to great advantage. They were used for all types of missions, from TOT to harassing fire. Near the end of Troop E's tour of duty with the battalion, it was firing on such choice targets as troop concentrations, gun positions, vehicles, etc. Because of the combined weight of the tank and gun there was little dispersion during heavy firing, and the FA battalion was enthusiastic about the firing speed and accuracy of the weapons.

When the 30th Division moved south to meet the onrushing Germans in the Ardennes forest, the squadron was attached to the 29th Division. The assault guns, again working under the control of a FA battalion, were set up east of Pattern within 1,500 yards of the front lines. The position was in a ravine which could be reached by a concealed route. Thirty feet in front of the guns a bank concealed the muzzle blast at night, thus providing concealment from any German OP, and cover from all except high trajectory weapon fire.

The guns remained in this position until December 24. Because of the unlimited amount of 75mm ammunition, the assault guns were used to cover the entire division front. As many as 500 rounds were fired each night, and 200 during the day. The troop again was complimented for its fire discipline, speed, and the accuracy of its fire, which were made possible by the 360-degree traverse of the turret.

On December 24, the squadron was attached to the extreme left flank of the Ninth Army, and moved into the small town of Suggerath, approximately 4,000 yards north of Gelsenkirchen, Germany. The 6 guns went into position in the village, which was in a valley that provided concealment, and was difficult for the enemy to fire upon. Again the troop was attached to a FA battalion, which was a part of the 102d Division.

It remained here for three weeks, and fired on many point targets—German patrols, vehicles, troops, concentrations, and harassing missions. Squeezed out of this sector in mid-January by the British advance to the Ruhr, it was attached to the 11th Cavalry Group, and moved into position at Linnich, Germany, to relieve the 44th Cavalry Reconnaissance Squadron.

The assault guns went into position about 4,000 yards behind the lines in rear of the village of Ederen, Germany; the same system of coördination with a FA battalion was employed, and the previous experiences duplicated. At times the troop also was assigned the mission of firing on Jerry antiaircraft batteries, and destroyed a number of them and their crews as they fired at Allied planes which were bombing and strafing targets directly in front of the troop's positions.

British-American Contact

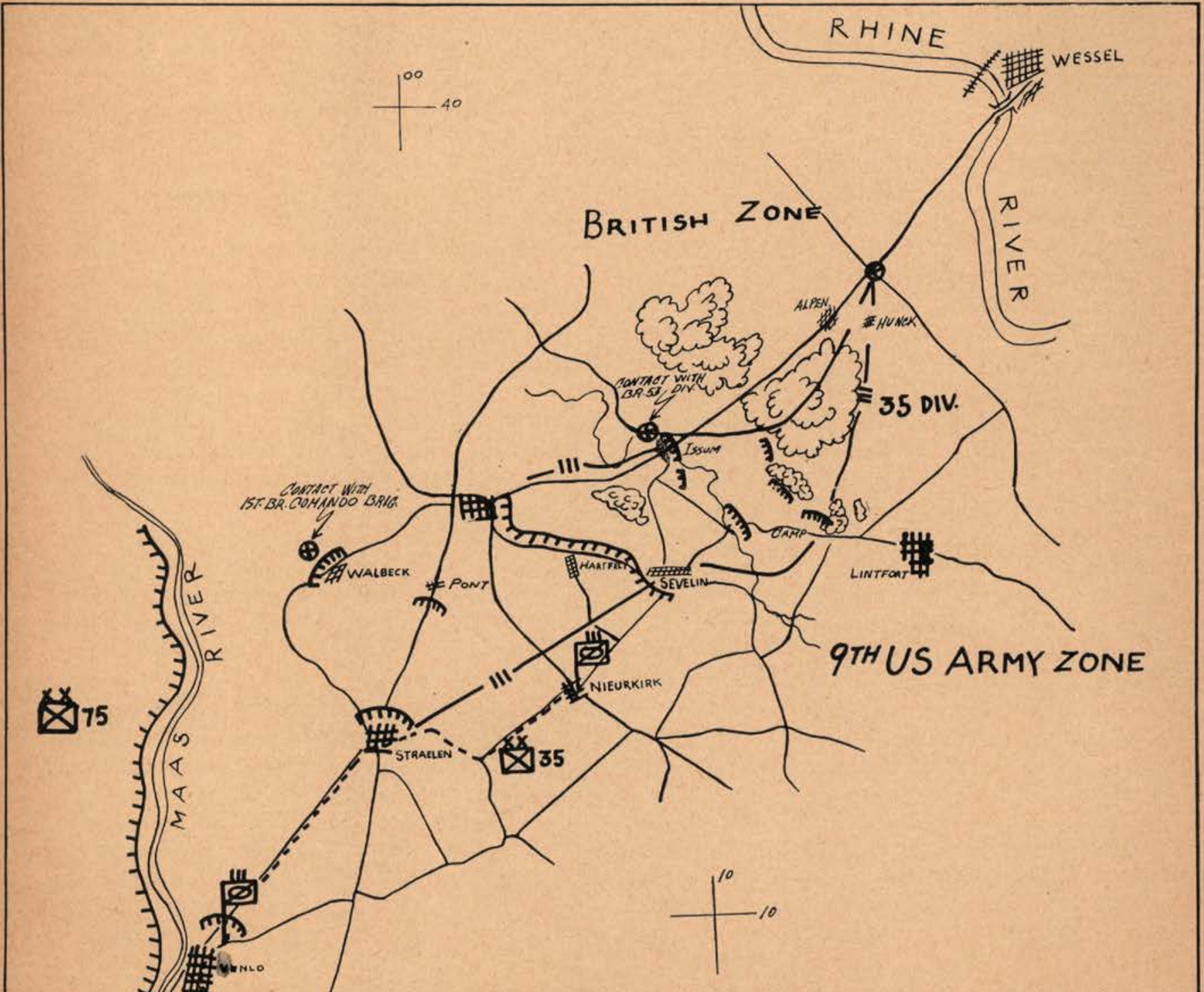
ON March 1, 1945, the 15th Cavalry Group received orders which relieved it from a defensive position on the west bank of the Roer River near Roermond, Holland, and directed it to proceed south to Heinsberg, Germany, then cross the Roer River. The 35th Infantry Division had already crossed the Roer on its way to the Rhine, and the group's mission was to screen the division's left flank, and to link up with the First Canadian Army, which was pushing south from Nijmegan, Holland, between the Roer and Rhine Rivers.

Group Moves Out

The 15th Cavalry Group, led by the 17th Cavalry Reconnaissance Squadron, moved out from Wassenberg, Germany, and headed toward Roermond. The troops entered the city from the east that evening without meeting opposition from the enemy. Since this was a strong part of the Siegfried Line, however, there were many enemy mines on the road, and squadron headquarters and Company F each lost some vehicles.

The 17th Squadron spent the first night just east of Roermond. Patrols were sent out to search for intact bridges across a canal and small stream between Roermond and Venlo, but it was found that in their evacuation from Roermond the Germans had blown down large numbers of trees across the roads and destroyed all bridges between the two cities. The squadron turned east 15 miles where a team of Troop C's 2d Platoon found bridges across the two streams, which were wired with dynamite and small bombs. These were neutralized and the group headed north to Venlo by an extremely devious route through the firebreaks of the forest. It entered Venlo on the evening of March 2 without meeting enemy opposition.

The next morning, still screening the 35th *Division's* left flank and endeavoring to link up with the Canadians, the group headed northeast toward Geldern, Germany. At Pont, Troop B, leading the 17th Squadron, met heavy opposition. Troop C was ordered to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VENLO

by-pass to the enemy's right flank, but found the bridges destroyed and returned to help Troop B take Pont.

The 2d Platoon of Troop C, 17th Squadron, in the meantime had entered Walbeck where it established road blocks, and against little resistance captured 11 enemy soldiers and large stores of weapons and ammunition.

The platoon occupied the town, and manned its road blocks during the night of March 3-4.

Armies Link Up

At 0300 on March 4 a large patrol of one officer and 60 men from the First British Commando Brigade walked into the platoon's area. After mutual challenging the patrol leader came forward to identify himself and his men, who had walked from Weil, Holland, a distance of 30 miles, to effect the link-up between the U. S. Ninth Army and the First Canadian Army. After an exchange of notes of military value, the Canadians moved back toward their starting point.

The next day the platoon was relieved by a platoon from Troop B, and rejoined its troop at Straelen, Germany, and later participated in guarding the forward echelon of the U.S. XVI Corps until the corps' headquarters moved across the Rhine River.

After the 15th Cavalry Group crossed the Roer at Heinzburg, the 17th Squadron took the lead in performing the group's mission to screen the left flank of the Ninth Army and establish and maintain contact with the British Second Army.

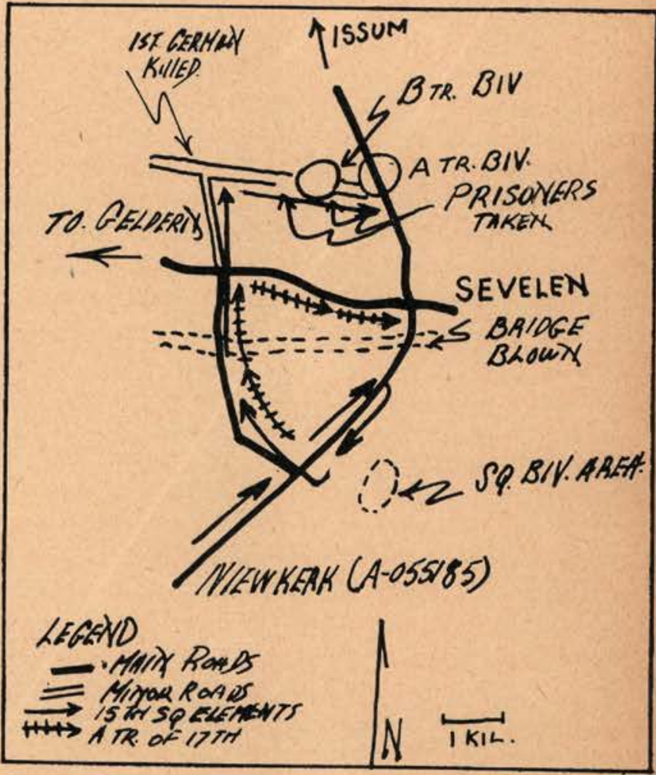
The 15th followed the 17th until it had reached Stadt Straelen, where the 15th was ordered to proceed to Issum. Troop A of the 15th was leading. The route selected was east through Nieukerk toward Sevelen. At 1300, March 2, Troop A was held up half a kilometer south of Sevelen by a blown bridge across a cut. The town had been occupied by elements of the 35th Infantry Division the night before, but the Germans had slipped in and blown the bridge. Tanks of the 35th were along the cut shelling the Germans beyond the town. In midafternoon Troop A of the 17th, advancing from Hartefeld toward Sevelen, met heavy resistance but was able to get a small unit on into Sevelen to contact our infantry.

About 1600 squadron headquarters decided to by-pass Sevelen by crossing a bridge just south of Hartefeld. Troop A was sent out ahead, and at Hartefeld took a minor road into the woods along which the first German was seen crossing a clearing on a bicycle. He was killed.

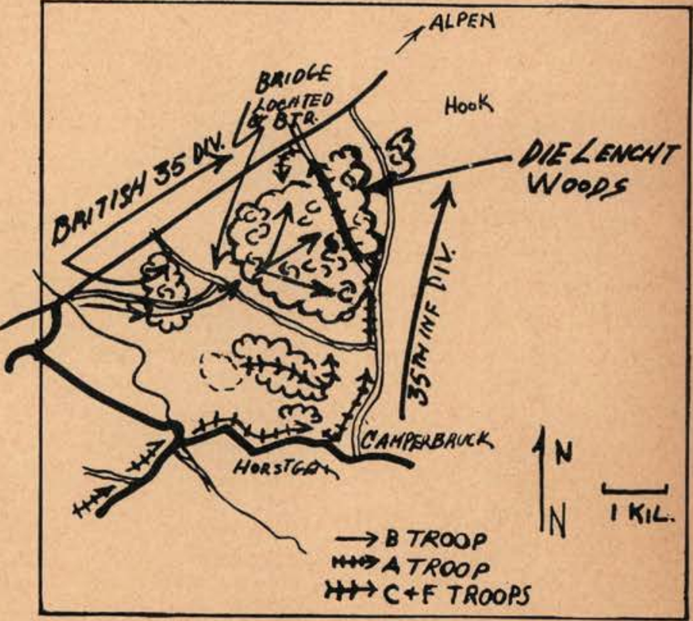
The troop then went east toward the main Sevelen-Issum road 4 kilometers away. It was getting quite dark so the column was closed up. Twice along the road small German parties ran into it before they knew who we were. The first group, armed with a machine gun and panzerfausts, was fired upon by the rear guard and one prisoner taken. The advance guard reached the Sevelen-Issum road about 2400 and bivouacked and informed squadron headquarters near Hoog of the location. Troop B, with a platoon of the 187th Engineers attached, moved into bivouac to reinforce A at 0130. During the blackout drive one bulldozer was overturned.

On the morning of March 3, Troop A moved east and south toward Sevelen in an attempt to contact the 35th Division. Troop B proceeded to Issum in an effort to contact the British. The 2d Platoon went northwest along two minor roads to cut the main Geldern-

First day of action, 15th Squadron.



Third, 4th and 5th days of action.



Issum road. En route it picked up German stragglers. Near the main road the platoon received small-arms fire, and took positions straddling the road.

BRITISH ARE CONTACTED

Heavy-tracked vehicles were heard approaching the position about 1100. German snipers in the woods fired in the direction of the sound. This drew tank fire on the 2d Platoon from the approaching British 53d Division. No casualties were caused. The 2d Platoon recognized the friendly troops and were able to identify themselves. This contact, at 1240, was the first that the 15th Squadron had made with the British.

The rest of Troop B had moved north on the Sevelen-Issum highway. The main body plus one platoon of assault guns halted and established positions about one kilometer south of Issum. The 3d Platoon was sent ahead to take Issum. It met small-arms fire and took positions near the bridge across the Nenneper River. At this point two Germans on bicycles came out of an alley and blew up the bridge. The blast killed one of the Germans and knocked Sergeant Smith of the 3d Platoon down. A German self-propelled gun withdrew 500 yards from its position across the river and started shelling the town. Assault gunfire was called for by radio. The assault guns had already been laid on the bridge by map, so it was possible to adjust fire on the self-propelled gun. It withdrew on the fourth round.

The troop consolidated its position and bivouacked in Issum. The next morning Troop A's 1st Platoon was sent south into Sevelen. Its mission was to contact the 35th Division and form liaison with its left elements. The remainder of the troop moved east on a secondary road.

Friendly TDs in position on the outskirts of Sevelen observed the troop approaching a crossroad about one and one-half kilometers east of their bivouac area. Not expecting friendly troops in front of them the TDs opened fire, knocked out one jeep and hit an armored car and another jeep with shrapnel. After the 10th round, Troop A realized that the fire was from a friendly source, and was able to attract the attention of the TDs by the use of yellow smoke and a waving panel. Troop A bivouacked in the vicinity for the night.

About 1000 that same day, Troop C had advanced past Troop A to reconnoiter for crossings over the Nenneper and Fleuvth Rivers. It crossed the Nenneper just west of Horstgen and most of its personnel continued into town and contacted the 35th Division. One platoon was sent north on a small road and encountered heavy fire at the edge of the woods just north of the Fleuvth. Toward evening it withdrew across the Fleuvth, and was joined by the rest of the troop, which bivouacked along the river.

ENEMY IS ENVELOPED

By the next morning, the third day of action for the squadron, the British had built two bridges at Issum. The squadron was to proceed northeast on the main road toward Alpen and Wesel. Troop B crossed the bridge at 0600 and reconnoitered roads to the southeast of the main road. The British were held up by a blown bridge and heavy resistance two kilometers east of Issum. Troop B already had reconnoitered a woods southeast of that point and found a bridge intact. When the information was reported to British Headquarters in Issum, where the 15th Cavalry Squadron Headquarters Forward was also located, the British moved out and effected a right envelopment of the Germans holding them up on the main road. Troop B consolidated its position along the southwest edge of the Die Leucht woods and remained overnight.

That same morning Troop A moved to Horstgen, less its 3d Platoon, which was sent to Camperbruck to reconnoiter for positions which would screen the 35th Division's left flank. Camperbruck was cleared in the afternoon by the 35th Division's tank-infantry team, which then moved into night bivouac on the north edge of the woods. The 3d Platoon of Troop A took a position for the night on the team's left, in a group of buildings that were in an uncleared section of the woods. During the day, Troop C had consolidated its position between B and the 3d Platoon of A.

The next morning Company F and Troop C were given the mission of flushing a small woods just south of the Die Leucht woods. They worked east and contacted the 3d Platoon of Troop A at the south end, without meeting enemy resistance. They also found part of Troop B on the road at the north edge of the wood. Keeping contact with the British on their left, Troop B worked east through the Die Leucht woods. At all times the squadron maintained contact with the British flank brigadier's headquarters through the use of liaison officers and radios.

The 35th Division fought its way north along the east edge of the Die Leucht woods, and the British advanced along the north edge toward Alpon. Both were meeting heavy resistance from stiff delaying actions which were supported by considerable self-propelled gunfire.

The area was becoming quite narrow between the Ninth Army and the First Canadian Army, so the 14th Squadron was relieved of its liaison and screening mission on the left flank of the Ninth. At noon on March 5 Troops B and C assembled at Horstgen, and squadron headquarters and F at Camperbruck. Troop A was attached to the 35th Division to continue the liaison mission with the British.

FINALE

Between March 6 and 9, Troop A maintained contact between the British and the left flank of the 35th Division. Progress was slow for the British because they were held up at Alpen. The Germans fought a stiff delaying action all along the east edge of the Die Leucht woods. Troop A's liaison was particularly useful when the forward elements of the 35th Division were drawing close to the British near Huck and Drupt. During this time radios were kept at both flank battalion level CPs.

On March 9 the Germans were pushed back across the Rhine, but not before they had blown both bridges at Wesel.

* * * *

A Night Patrol in the Siegfried

by Captain Norman F. Ralston

A NIGHT MISSION to reconnoiter Roermand and its heavily mined approaches for hostile forces had been assigned a task force composed of the 2d Platoon, Troop C; the 2d Platoon, Company F, 15th Cavalry Reconnaissance Squadron; and the 1st Platoon, Company B, 187th Engineers.

EACH UNIT ASSIGNED TASK

Each unit was given a specific task. The 2d Platoon, Troop C, was to reconnoiter the route and provide local security, and the 1st Platoon, Company B, was to clear the road of mines, road blocks, and obstacles. The 2d Platoon, Company F, composed of light tanks, initially was to strengthen the line of departure, and once the mission was under way it was to follow as a reserve and prevent hostile forces from cutting off the patrol from the rear. Also attached was a demolition squad which carried equipment to blow mines or to blast out road blocks.

In supporting positions were one battery of the 691st Field Artillery, one platoon of 4.2-inch mortars, a platoon of assault guns, and a platoon of tank destroyers. All had planned fire concentrations on likely targets. The artillery was directed by a forward observer who accompanied the patrol, the mortars were under squadron control, and the TDs and assault guns under command of Troop C's executive officer. The assault guns were to cover the formation of the patrol with harassing fire, and the TDs were in position to fire on long-range targets or to contest any opposing armor.

It was known that the area had been haphazardly mined with antitank and antipersonnel mines, and that some of the buildings had been booby-trapped. Consequently patrol members were ordered not to go into any building unless opposition came from it. If hostile activity drove the patrol from the road, the leading elements were to clear the ditch and go to the left of the road under the command of the reconnaissance platoon leader. The main body was to do likewise to the right and rear under command of the platoon sergeant. The engineer party was to withdraw to the rear.

PATROL'S ORDER OF MARCH

The patrol formed at dusk northeast of Linne and moved out at 2230. The enemy had become strangely quiet. Except for a little harassing mortar fire in the afternoon, he had apparently closed shop. Three scouts preceded the leading patrol elements by 200 yards, one armed with a rifle, two with submachine guns, and each carried a small limber stick which was pushed along in front of him to detect any trip wires across the road.

Following the scouts in staggered formation were three three-man teams of mine sweepers, each composed of an operator, a prober, and a rifleman from the point. Immediately behind the mine sweepers came the remainder of the point, armed with a light machine gun and bazooka. The point was followed closely by a party of 12 markers and mine pullers.

The patrol's main body followed the markers and mine pullers by 200 yards to allow time to mark or pull any scattered mines. The main body was composed of two sections from the reconnaissance platoon and the remainder of the engineer platoon. The engineer party was to clear any obstacles which had been by-passed.

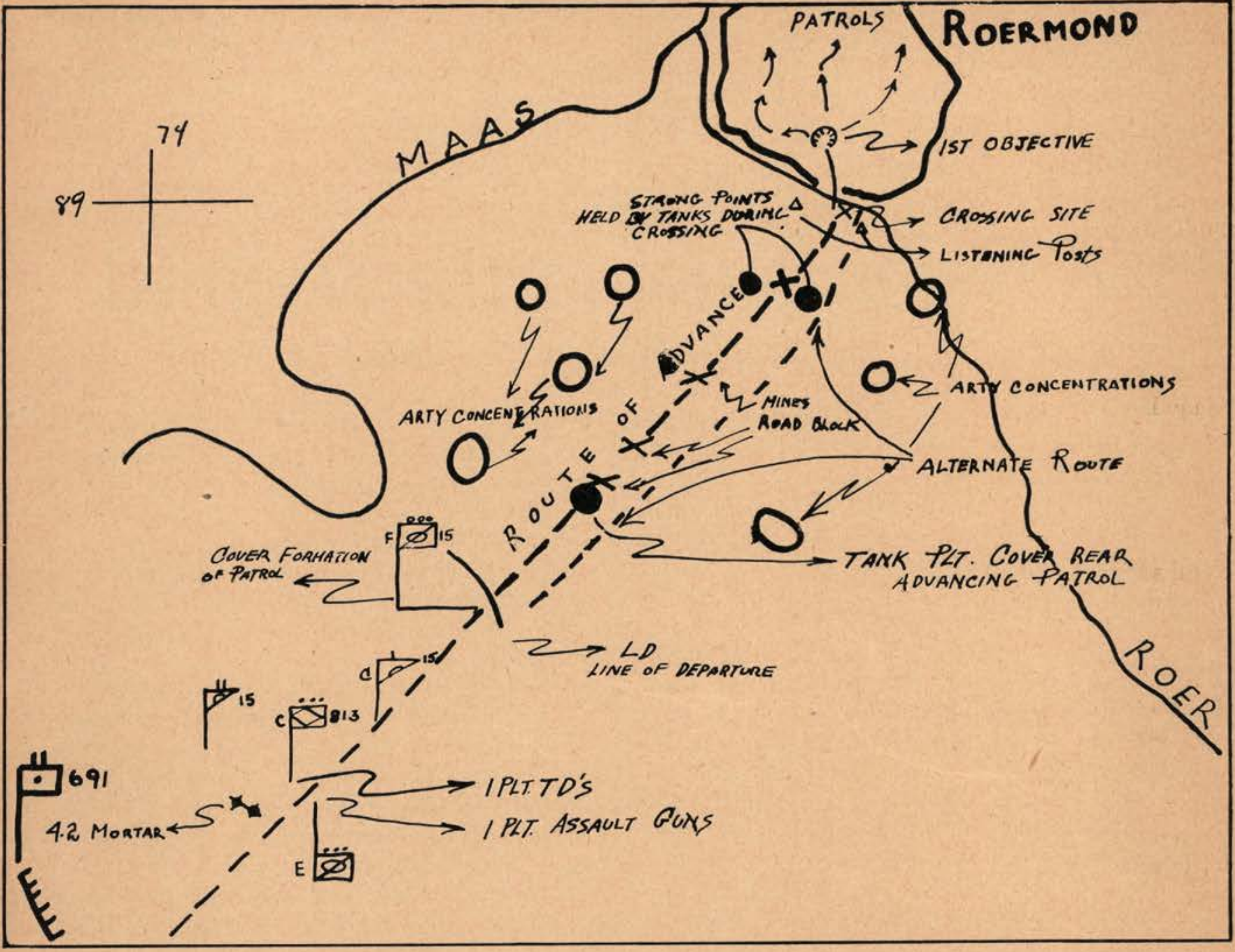
The rear guard followed at 100 yards and was composed of one ¼-ton carrying radio, communication party, and a light machine gun, and a ¼-ton carrying the demolition party with its equipment and a light machine gun. Since support fire was to come from artillery and assault guns, the mortar squad (60mm) formed the rear element.

Mines and dismounted enemy had been cleared from the line of departure the previous afternoon.

As the patrol moved forward the assault guns laid harassing fire in the vicinity of Merum to the left of the route of advance. No obstacles were encountered until the patrol had traveled about 1,000 yards. Here the way was blocked by a well-laid field of Regal mines and debris that had been booby-trapped. The debris was cleared away and a zigzag trail was discovered through the field. No enemy was encountered.

The tank platoon was brought up to this point to cover the north and south roads. The harassing fire ceased and the patrol advanced, leaving a party to clear the road of mines. A small number of mines were found at the crossroads but the patrol's progress was slowed only a few minutes.

The patrol came upon a road block of iron rails, wire,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and a heavily mined area. Scouts were sent out and the area was found undefended, whereupon the engineers and demolition party reduced the obstruction. Numerous and scattered mines and removable road blocks were encountered up to the riverbank.

A small patrol had worked its way through the field, and at 1235 reached the river bank where it set up listening and observation posts. Scouts reconnoitered the river, over which all bridges entering the town had been completely demolished, for a crossing site. At 0215, the main body arrived at the river.

The buildings and high ground were reconnoitered, and strong points of one section each were set up at two points. Another section remained in observation along the river. Only occasional lights were observed on the east side of the town.

After the roads had been cleared, assault boats were brought up. Because of the swift current a crossing site between the highway and the railroad bridge was chosen.

Tanks were moved up to cover the high ground on the south riverbank.

River Is Crossed

Crawling across the river on the debris from the bridge, the first section crossed before dawn. It was to investigate the defenses immediately across the bridge, then continue to a point at which it was to establish holding positions until joined by the remainder of the platoon. The first section reached its objective, and the remaining two sections crossed immediately to join it. Patrols then were sent to north and east sides of the town in which extensive road blocks, mines, booby traps, and damages from the demolitions were found, but no enemy. Civilians reported that enemy troops had cleared out at dusk, en route east.

The patrol withdrew from the town at 1200. The corps commander now knew that the enemy was fleeing from the Siegfried Line.

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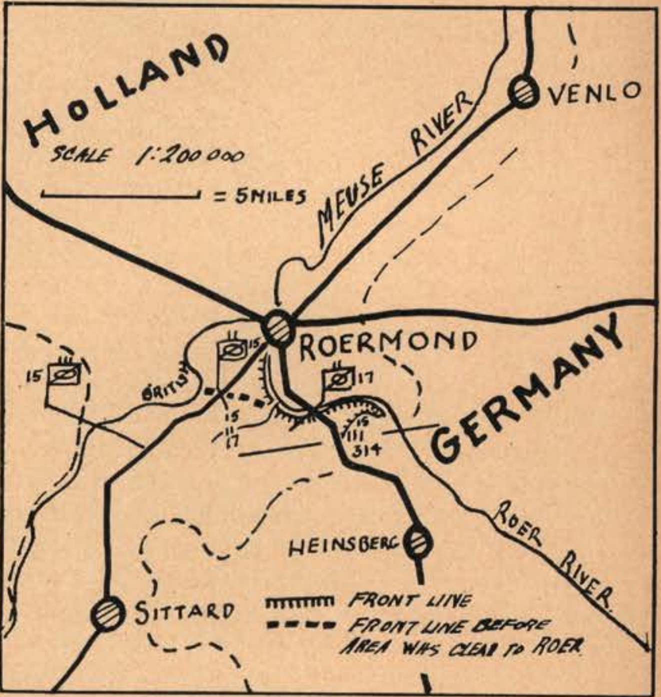
The Relief of An Armored Division

by Major Herman M. Marlow



AT 1000, February 27, 1945, the 15th Cavalry Group and its attached squadrons reverted to the direct control of the XVI Corps and was ordered to relieve the 8th Armored Division and establish a defensive line on the west bank of the Roer River.

The relief of the division, which occupied a sector from Vlodrop to Roermond, took place during the night of February 27-28. It was completed by 0010, and by 1200, February 27, the group CP had been established at Echt.

In the group sector the 15th Squadron relieved CCR on the left, and the 17th Squadron relieved CCB on the right. The front line extended from Vlodrop, on the south, to the Meuse River, on the north.

The width of the group's sector, and the size of the unit it relieved, as compared with a cavalry group, made it necessary for each squadron commander to reorganize his assigned sector so that units could be employed effectively.

Disposition of Troops

The reconnaissance troops were employed on the line to establish defensive positions, and the tank companies were held in squadron reserve. In each squadron's sector, the assault gun troops furnished direct supporting fires through the F.D.C. of the supporting artillery, an element of the 8th Armored Division. No other forces were at the disposal of the group.

The front line in the 15th Squadron's sector had not been cleared of enemy to the Roer River, but it was believed that the enemy would soon withdraw across the Roer in order not to be cut off by a task force of the 35th Division, which was spearheading northward to Venlo, east of the Roer.

The enemy was employing a passive defense and using little harassing artillery, consequently the group's thinly held line was sufficient to serve as a screen which could report any attempted enemy reconnaissance and/or offensive action. In positions not actually occupied by troops because of the width of the sector and the terrain, trip flares and patrols were used to cover the front.

The group remained in this sector until relieved to participate in the Ninth Army's operation "Grenade."

Conclusions

A cavalry group which is employed in a defensive rôle, such as has been described, must depend entirely upon the tank companies for its counterattack force because all platoons of the reconnaissance troops are distributed along the front, and there are no reserves to shift. This is a good argument for a three-squadron group. A great deal of unavoidable congestion and noise occurred with this size unit when the relief was effected, and could have resulted in aggressive action, had the enemy been on the alert and offense-minded.

* * * *

Cavalry Holds A River Line

by Major W. E. Hudson

DURING the final days of March, 1945, elements of the XIX Corps of the Ninth Army crossed the Rhine River and rapidly thrust eastward toward the Elbe River. A deep penetration was thus effected into enemy territory. On the southern flank of this penetration was the enveloped Ruhr pocket; on the northern flank were scattered elements of enemy troops.

Mission

On March 31, the 15th Cavalry Reconnaissance

Squadron was given the mission to seize and hold all crossing over the Lippe River in its assigned zone, and to reconnoiter south of the Lippe River and Canal if the crossings were found to be intact. A secondary mission was to establish a counterreconnaissance screen along the north bank of the Lippe River and prevent enemy infiltration into the squadron zone.

Some 300,000 enemy troops were reported encircled in the Ruhr district immediately south of the Lippe River and Canal. There were portions of many enemy divisions contained in the area, including elements of the 116th Panzer Division, and the enemy was considered capable of pushing north and severing the supply lines of the XIX Corps. The Third and Ninth Armies were progressively tightening their ring of troops around the Ruhr pocket. During these operations the enemy was counterattacking, indicating that he was still organized and that breakouts were desired.

The squadron moved from its bivouac area near Wulfen at 1445 on March 31, and at 1630 entered its assembly area immediately east of Haltern with two troops abreast. Troop B was on the right and Troop C on the left. Troop A, Troop E, and Company F initially were in squadron reserve, moving with the squadron CP through the center of the squadron zone. One platoon of Troop A and one section of Company F were on detached service to higher headquarters and did not participate.

At 1727 the first afternoon, Troop B had reached the Lippe River without encountering enemy resistance, and had established a counterreconnaissance screen in the vicinity of Hasbring, Wiesmann, and Heumann. All bridges within the zone were blown by the enemy to prevent a further advance.

ENEMY CONTACT

In its advance, Troop C made contact with the enemy at 1830, when it met stiff resistance from a wooded area immediately south of Ubbenhagen. One platoon had inadvertently traveled out of its zone and entered the town of Werne on the Lippe River immediately to the left of the squadron zone. As the platoon approached the bridge spanning the river it was blown by the enemy and a sharp fire fight ensued. Later that evening, discovering that it was out of its assigned zone, the platoon gave its information to elements of the 17th Cavalry Reconnaissance Squadron and withdrew into the proper area.

At 2015 the remaining platoons of Troop C, which were pushing deeper into the woods just south of Ubbenhagen, encountered intense enemy fire from panzerfaust and small arms. Inasmuch as darkness was closing in, Troop C was withdrawn to a position just north of the woods. One platoon of Troop A and one from Troop E then were placed under Troop C's control and were utilized to reinforce its positions for the night.

Immediately after the squadron's arrival in its assigned zone, while it was still daylight, Troop A reconnoitered to the flanks and rear and made contact with friendly troops without encountering any enemy.

MOP UP

The following morning at first light Troop C, supported by Troop A, Company F and Troop E, continued the advance on the Lippe River. The enemy that had given opposition the previous night had withdrawn to the river line, which was reached without serious fighting. Small-arms and scattered artillery fire then were received from the south bank of the river, and a counterreconnaissance screen was established in the troop's zone. The remainder of the second day was spent mopping up stragglers, safeguarding enemy equipment and installations and in improving defensive positions.

Troop E took up battery position for indirect fire missions to the left center of the squadron zone, and registered-in its guns preparatory to firing missions south of the Lippe Canal or laying defensive fires should the enemy attack. Contact to the flanks was established, and late in the afternoon a change in dispositions was made on order from higher headquarters which increased the total squadron front.

The third day was occupied in firming-up all positions, replacing radio communications with telephone, laying defensive action plans, and in general increasing the safety of the entire squadron position.

During the first three days operation, 137 POWs were taken, but only 12 dead were counted. Questioning of prisoners revealed that enemy troops were withdrawing to the Dortmund area.

OPERATION CONCLUDED

During the remainder of the operation, until April 12, when friendly troops cut across the squadron front south of the Lippe Canal, the operation consisted largely of routine observation, indirect fire missions and blocking of tank approaches. During the latter period an additional 92 POWs were taken, and continued small-arms and artillery fire, including air bursts, were received from enemy positions.

An interesting sidelight on this operation was the delay caused by a small dismounted enemy party at night. Troop C had been held up the first night by dismounted enemy troops armed with panzerfausts and light machine guns. The following morning, with tanks and assault guns, the troop had advanced practically unopposed. The combination of darkness, dense woods and familiarity of terrain had enabled the enemy to hold up the advance of Troop C. In daylight, however, the enemy's position became untenable and he withdrew.

(The End)

Communications in Combat

by Captain Carl E. Seitz*

THE communications system of the 15th Cavalry Squadron was severely tested in the squadron's great variety of missions as it moved across Europe. Its route was from the beaches of Normandy and the hedgerows of Brittany to the hills and plains of northern France, and then into the mountains of central Europe.

In the hedgerow country of Normandy and Brittany the -506 radio was used as the principal means of communication between troops and squadron headquarters. The size of the squadron zone necessitated the dispersion of its units to such an extent that, over the uneven terrain, the -508 radios would not cover the distance. The -508 served within the unit itself, however, and its simplicity of operation enabled it to be operated by other than trained personnel. This alleviated the terrific strain on the regular, assigned radio operators.

During this campaign, some units of the squadron were assigned dismounted patrol missions, and were handicapped in their communications. SCR-510 radios were dismounted for use on the patrols, but proved quite unsatisfactory because of their bulk. Defects developed from exposure to wet weather, and it became necessary to secure infantry SCR-536 sets. These proved satisfactory, although lack of time and equipment prevented the coördination of the frequencies used.

Relieved of its assignment on the Brittany peninsula, the squadron moved east across northern France and established its CP near Blois. It took over the job of patrolling the Loire River from Auxerre in the east to Nantes in the west, an air-line distance of approximately 240 miles. During this mission, the -506 really proved itself by maintaining contact between the squadron and the CPs of units on patrol, which were located 80 and 90 miles away. A "flat top" antenna was erected, and this seemed to "reach out and get them." A relay station was necessary to reach the units patrolling the most western portion of the river.

When the squadron was assigned the mission of containing the enemy forces in the St. Nazaire pocket, the use of the telephone as a supplementary means of communication was initiated, and soon became the primary means of communication between the immediate units in that area and their platoon outposts. The telephone proved not only convenient and secure, but highly valuable at night when enemy "jamming" made radio communication extremely difficult. Since at this time the squadron TO/E did not provide for wire communication equipment or personnel, it was necessary to borrow telephones, wire, wire-laying equipment and switchboards.

The squadron moved across France, through Belgium, and into Holland to join in the "Push" to the Rhine. From the Roer to the Rhine, on missions such as dismounted reconnaissance patrols, phone communication proved invaluable as the sole means of communication. We were unable to obtain more than a limited amount of wire from supply sources, and all such communication was maintained with improvised and captured German equipment. The improvised material proved highly impractical, but after numerous attempts and considerable waiting we finally acquired an RL-31. Thereafter our wire-laying problems were solved.

During the waiting period, prior to the crossing of the Rhine, the telephone also served to facilitate the making of plans and the maintenance of their secrecy. It is not intended to imply that in general during the latter campaign, the primary medium of communication was by telephone. On the contrary, in most cases the uncertainty of the length of any particular mission, and the rapidity of the squadron's advance made the establishment of wire communication impracticable, and necessitated the continuous use of radio for long intervals. Even when telephone communication had been established and had become the primary means of communication, a continuous listening watch was kept by squadron headquarters on the squadron command net in order to insure continuous contact with the units in case of the failure of the telephone. In some instances, reliefs of units were so effected that the phone lines laid by the infantry were left intact, and required only the attachment of phones to establish communication. Usually, however, the infantry switchboard had been pulled and the lines left untagged prior to the squadron's arrival for the relief. Phone communications to the troops then became a problem. Wire crews would start "trouble shooting" strange lines, and by the time they could "feel out" the line routes the squadron had been assigned another mission and was ready to move forward. When this happened, radio was used.

After the Rhine was crossed, a series of long movements and short stops necessitated the continued use of radio as the principal means of communication. Wire was occasionally used as a supplement. Our assignments carried us into the mountains of central Europe. Here we were given considerable trouble because of dispersion of units, the unfavorable terrain, and the increased interference from enemy "jamming" stations.

Fortunately we did not remain in this mountainous section for any great length of time, but moved to more favorable terrain, where the units were assembled to perform security patrols in a much smaller zone. This was shortly before VE-day, and as the situation became more static we began the employment of the telephone again. As field wire, a critical item throughout the campaign, had become practically unobtainable, commercial telephone lines were used to a great extent in establishing such communication at this time. By now we had obtained sufficient captured German telephones and switchboards to efficiently maintain wire communication within the squadron, and between the squadron and the group. This equipment proved its value in the following days, during the readjustment and reassignment of personnel within the group.

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*15th Cavalry Reconnaissance Squadron.

RECOMMENDATIONS

In summarizing, it seems well to point out the deficiencies noted during our entire operation on the continent, and to offer the following as recommendations for the improvement of communications in a cavalry squadron:

1. Because of the lack of a -506 radio, frequent complications developed in the maintenance of contact between the squadron and its assault gun troop. An addition to the TO/E of a -506 radio, plus personnel to operate it, would eliminate such complications.

2. A reconnaissance troop carries 12 -506 radios with an authorization of 22 radio operators and assistants. The troop communications sergeant can act as one assistant radio operator, but that still leaves one operator without an assistant. An additional two assistants, (CW) radio operators, would alleviate the situation and allow the communications sergeant to properly supervise communications within the troop.

3. A reconnaissance troop equipped with its 35 radios, which presumably is more than is provided by TO/E for other units of its size, needs an additional radio technician to help maintain its sets, and to insure their continued performance in the event of the loss of key personnel. Replacements for such personnel seemed to be unobtainable throughout our entire continental operation. These technicians should be equipped with a ¼-ton truck for transportation, and a ¼-ton trailer for carrying their maintenance equipment and supplies.

4. The squadron radio technician must be one of the most competent men in the squadron; therefore, it is felt that the rating he carries should be a T/3 rather than the T/4 which is authorized. An assistant squadron technician could also be used and the T/4 rating should be given to him. A ¾-ton truck should be provided as a workshop and a means of transportation. It would give the assistant squadron technician a place for repair work during blackout.

5. Taking into consideration the varying degrees to which wire communication was employed by the squadron, and striking an average, the following recommendation is made for TO/E on wire communication equipment and personnel:

(A) Squadron Headquarters:
  (1) Wire crew—Wire chief—Rating of Sergeant
        Wireman —T/4
        Wireman —T/5
        Driver —Pfc
  (2) Vehicle for wire crew—¾-ton truck
  (3) Wire, W-110-B—6 miles (1 mile to run to each troop), (1 mile for CP and repair).
  (4) Reel Unit, RL-31—1
  (5) Telephones, EE-8-A—7 (1 (CO-EX), 1 (S-3), 1 (-2), (1 Hq. Tr.), 1 (spare), 2 for wire crew test phones).
  (6) Switchboard, BD-72—1
  (7) Switchboard operators—2 with rating of T/5
  NOTE: The present TO/E authorizes the following:
    1 switchboard, BD-71 (6 drop)
    5 telephones, EE-8-A
    1 RL-27, hand reel for laying wire
    3 miles of W-110-B wire on DR-4
(B) Reconnaissance Troop:
  (1) Wire crew—Crewman with a rating of T/5
  Wire —Crewman with a rating of Pfc.
  (2) Vehicle for wire crew transportation and carrying wire crew equipment
  (3) Wire, W-130—3 miles (1 mile to reach to each platoon)
  (4) CE-11, reel equipment—3 (includes 1, TS-10 handset each)
  (5) TS-10, handsets—6 (2 per platoon)
  (6) Telephones, EE-8-A—5 (1 (CO), 1 (EX), 1 each platoon)
  (7) Switchboard, BD-71—1
  (8) Switchboard operators—2 ratings of T/5
  NOTE: Present TO/E is as follows:
    1, ½ mile, W-130 wire
    3, CE-11, reel equipment
    3, TS-10, handsets
(C) Assault Gun Troop, and Tank Company:
  (1) Same recommendations as per reconnaissance troop
  NOTE: The present TO/E does not authorize wire communication equipment or personnel for either of the above units.

With the equipment and personnel suggested in the preceding paragraphs, it is felt that a cavalry squadron would be prepared to perform missions of the types it was assigned during the campaigns on the continent.

* * * *

Members of a tank destroyer unit of the U. S. Ninth Army guarding a roadway in Germany, January 22, 1945.

Signal Corps Photo

The 11th Cavalry Group in a series of actions

The Battle of the Roer

ON December 11, 1944, the 11th Cavalry Group marched out of Holland and into the front lines in Germany. Assigned to the Ninth U. S. Army, and attached to the XIII Corps, the 11th Cavalry's initial combat mission was to relieve the 406th Infantry Regiment of the 102d Division, which was defending an area between Linnich and Lindern, Germany, near the Roer River. Organized and trained for war of movement, the troopers nevertheless adapted themselves so readily to the doughboy rôle that they drew nothing but praise from both division and corps commanders.

On December 12, group and squadron headquarters established CPs in Gereonsweiler. The reconnaissance and tank units parked their vehicles in the rear areas and walked into the line. The assault guns were attached to the 102d Division Artillery for fire missions in direct support of the sector.

Troops on the line during this period came into contact with Nazi propaganda through a loud-speaker which broadcast musical recordings intended to make the Yanks long for home. Propaganda leaflets, sent over in base-ejection artillery shells, had the same intent and bore themes which revealed the depraved, unscrupulous Nazi character.

On December 22 the group was relieved by the 406th Infantry and reassigned a sector just south of Linnich on the Roer River. The CP was established at Setterich, and the 36th was directed to defend the assigned sector and the 44th was placed in mobile division reserve. The assault gun troops were shifted to Ederen and attached to the 252d Field Artillery Battalion for fire missions. On December 23 the group moved its CP to Ederen, and the 44th Squadron relieved elements of the 406th Infantry near Linnich.

Intensive patrolling was again resumed, with the added difficulty of crossing the Roer River each time.

On December 26-27 a patrol, consisting of 18 enlisted men of Troop A, 36th Squadron, and led by Lt. Colonel Candler, Squadron CO, crossed the Roer near Tetz on a footbridge constructed for that purpose by the engineers. Aided by Major Krampitz and Lieutenant Sullivan, Colonel Candler led the patrol toward Tetz until it was pinned down by barbed wire, rifle and burp gun fire. Major Krampitz eliminated the burp gunners by grenades, and the patrol proceeded until broken up by heavy mortar concentrations.

By 2350 the patrol had returned in small groups, except for three officers and three enlisted men. The two field officers, now alone, continued on the mission and ran a 9-mile gauntlet of sentries and groups of Germans to capture a prisoner. While the officers were endeavoring to return, the prisoner fell into the river and his shouts drew fire from the Germans. Major Krampitz received a flesh wound and the prisoner escaped.

The officers returned at 0150 and at 0245 Colonel Candler again led a platoon across the Roer to rescue the others who were missing. The force met heavy fire. Colonel Candler was wounded and they were forced to return at 0530 without accomplishing their mission.

At this time the great German counteroffensive into Belgium and Luxembourg was nearly two weeks old and with fanatical fury the Nazis had pushed a bulge almost to the French border. Many combat units had been pulled out of the line in static sectors and thrown into the battle to halt the Nazi offensive. This resulted in a considerable thinning of the line in the XIII Corps' sector, and eventually the 11th was occupying the same front originally held by the 102d Division when the group was committed.

In addition to the sector's enlargement, the new year, 1945, brought with it a new directive for harassing the enemy. Plans were immediately instituted to carry it out. A "Commando" platoon, composed of volunteers from all group units, was organized to operate as a combat patrol under the personal direction of the group commander. Dummy tanks were constructed, provisional weapons units were formed, and a scheduled firing of pyrotechnics were all coördinated with other activity of the reserve tank company.

The program got under way early January 2 when Company F of the 36th ran its tanks along the roads of the front, and the provisional .50 caliber machine guns opened up on the enemy position. As expected, this activity drew heavy artillery fire from the Germans, which promptly was neutralized by our counterbattery fire. The dummy tank positions also drew enemy fire.

The program was effectively climaxed on January 6 by the "Commando" platoon in an elaborately planned raid designated as operation "Cleaver." Its objective was the destruction of a troublesome troop shelter from which the enemy launched harassing operations into our sector. Led by two officers, the patrol moved to its forward assembly area after hundreds of rounds of artillery and mortar shells had been poured into the adjacent enemy positions. Covered by a smoke screen, the "Commandos" jumped off at 1630, and quickly achieved their objective before the surprised enemy could open up.

Covered by the rest of the patrol, two men of Company F, 44th Squadron, entered the shelter and placed a 40-pound charge of TNT, which completely destroyed it. After eliminating all enemy resistance near the objective, the patrol withdrew under heavy fire of all types, and narrowly escaped being cut off by the enemy, who had infiltrated behind it.

No detail had been neglected in planning the patrol's operation. One which possibly saved many lives was the foresight which resulted in running a wire line from the 102d Division Artillery fire direction center to the colonel's OP, which was in the attic of a house on the outskirts of Linnich, immediately adjacent to the terrain over which the combat patrol operated. The attack of our combat patrol was the signal for the enemy to fire on Linnich with all their artillery. The artillery FO was heard to tell the fire direction center that his OP was getting too hot and that he was withdrawing. Shells were bracketing the colonel's OP, and one crashed through the attic in which his party was located. Realizing that to withdraw would leave the patrol without artillery support, the colonel ordered the

U. S. Ninth Army engineers build an assault bridge across the Roer in Germany.

Signal Corps Photo

enlisted men to the basement below, and, with Captain (now Major) Brett, Captain (now Major) Todd, and Captain E. C. Jones, 44th Squadron, who refused to retire, the colonel personally acted as FO and directed the fire of the division artillery until completion of the action. The patrol's officers later stated that without the help of our artillery all the patrol would probably have been killed.

On January 13, the 17th Reconnaissance Squadron was attached to the group and was sent into the Linnich sector to relieve the 44th Squadron, which was sent back to a rest camp for maintenance and orientation.

The 36th Squadron, still on the line, continued to conduct aggressive patrolling over the Roer River. On the night of January 16-17, a volunteer patrol of Troop C crossed the Roer, assaulted a strongly defended troop shelter, captured a prisoner, and, after blowing up the shelter, successfully returned with the prisoner. This outstanding success was achieved because careful planning and reconnaissance had been carried out for 72 hours beforehand. (*This is apparently the same patrol operation as described in great detail in the article "Operation Snare," also appearing in this issue.*—Editor's Note.)

During this period, the British were attacking steadily in the 21st Army Group's sector immediately to the north in order to extend their lines to the Roer River in preparation for the great spring offensive. From Linnich to the northern boundary of the American XIII Corps' sector, the battle line had not been extended to the river. Consequently, it was necessary for the corps to coördinate an attack with the British drive which would clear the western side of the Roer for use as a springboard in the big drive to come. This attack was designated as operation "Swift" and certain supplementary missions were assigned the 11th Cavalry Group.

A deserter picked up by the 36th on January 25 at 2300, volunteered the information that most of the Germans had retired across the river. Three patrols from the 44th Squadron immediately were sent to verify this information. One of the patrols pushed into the outskirts of Brachelen under sporadic enemy fire, and found that the town was only lightly held by a delaying force.

As a result of the indicated enemy withdrawal, H Hour was advanced from 1000 to 0630, January 26, and the lavish artillery preparation which had been planned was cancelled in order that the dawn attack might be a surprise.

Troop B spearheaded the 36th's attack, with A and C in support, and soon occupied the objective. Heavy fire was immediately received from Gut Rischmuhle and, although it was an infantry objective, Troop C, moving around the left flank, captured it and flushed 23 Germans into the arms of Troop B. The 17th Squadron moved out to occupy its objective and at 0853 the division announced that all objectives had been taken. At 0920, corps announced that the operation had been completely successful.

Operation Snare

by Captain John E. Newlin*

CARDED

On the bitterly cold night of January 17-18, a 30-man combat patrol was to cross the Roer River in a mission known as "Operation Snare," to capture a prisoner for identification and to blow up a troop shelter.

The enemy situation along the front at the time was static. Jerry activity had been limited to small patrols, sniper fire, and intermittent artillery.

Patrol Planned in Detail

Since the weather was extremely cold, it was considered essential that all of the men be gotten across without getting wet in order not to impair their efficiency. In order to avoid detection the crossing also had to be made with maximum quiet and reasonable speed.

To determine the best means of crossing, all river characteristics were carefully noted, including the depth, width, current, banks and bottom of the river, and a list made of the methods available—with favorable and unfavorable comments—as follows:

Bridge: *Favorable*—men could cross without getting wet. *Unfavorable*—too much time and too many persons required for construction. Too noisy. Too easily knocked out. *Decision*—not practical.

Ford: *Favorable*—quick and noiseless. *Unfavorable*—men would get wet and thus become too cold to work efficiently. Bottom of stream slippery. *Decision*—not practical for the initial crossing, but satisfactory for return trip provided a guide line was employed to help the men hold their feet in the swift current.

Boat: *Favorable*—quiet and quick. Men would be dry upon reaching other side. *Unfavorable*—river current would make crossing difficult. Drift. *Decision*—if a light boat was used it would be likely to overturn. An engineers' boat would be heavy and require too much personnel to handle. A light rubber boat, therefore, should be used, and instead of using paddles, it should be swung across like a pendulum, using a rope tied to the bow of the boat and anchored ashore.

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*Commanding Troop C, 36th Cavalry Reconnaissance Squadron.

Our patrol had been given the mission 4 days in advance. Two nights before the jump-off, a 4-man reconnaissance patrol crossed the river to definitely locate the enemy positions, and to test the practicability of this method of boat crossing, which had not been tried by this troop. The patrol returned and reported the test to be satisfactory. The enemy positions located were recorded, and a plan of action was drawn up in the minutest detail.

PLAN OF OPERATION

Although the actual crossing was to be made by 28 men and two officers, the services of the rest of the troop were required to accomplish the mission. A boat detail of 4 men was to provide transportation, and two 6-man covering forces were to protect the boat party. Once across the river, a two-man team was to proceed upstream and anchor a rope, the loose end of which was to be thrown to a man on the near bank to be secured. The rope was to be used to assist the men across the river when they returned.

A covering party was to take position near the anchored end of the rope on the enemy shore to prevent this route of escape from being cut off. The remaining 23 men and two officers were to go forward and assault the shelter, capture the prisoner, and then blow up the shelter with satchel charges carried by a demolition party.

For several days before the operation, 60mm mortars fired on likely enemy targets, shooting sporadically to simulate random fire. On the night of the operation, one mortar battery laid diversionary fire to the patrol's left flank. Another battery, which had been registered on the patrol's objective, was to fire only on call. The 81mm mortars in the center of the squadron's sector were registered on known enemy positions that might give trouble. The .50 caliber machine guns along our base of fire were sighted-in, and limiting stakes were set.

One section of a footbridge was carried for use in crossing a small creek which adjoined the launching site. Every possible precaution was taken to keep the men's feet dry.

Direct phone communication was provided from the launching site to the FO, mortars, and base of fire by telephone wire which was laid over two widely separated routes. The patrol leader carried a -536 radio, and another was kept with the telephone at the launching site from which the entire operation was to be coordinated. In the event the radio failed and the patrol had to change its route, the patrol leader was to signal back with a flashlight with a lens blacked-out except for a pin-point hole. No code would be needed, as an alternate route had previously been chosen.

All of the patrol members were volunteers. During the two days preceding the operation they were briefed, assigned jobs, and spent every daylight hour studying the terrain. An overlay of all concentrations was memorized since map reference would be difficult at night.

The patrol was scheduled to start crossing in rubber assault boats at 2100, January 17. The night was clear and cold and the ground covered with snow. At 2000, the boat detail arrived at the launching site with rope, boat and the section of bridge for crossing the creek. At the same time the two covering parties went into position on either side of the launching site. At 2100 the white-clad patrol, moving with 5-yard intervals between men, could barely be seen approaching the spot where the boat detail waited for them.

The first three men climbed aboard, and the rope was let out. The boat drifted with the current, its bow upstream, and, upon reaching a bend, was forced by the current against the enemy shore.

The men disembarked, and the boat was pulled back to the near shore. Ten loads were ferried across in little more than 10 minutes. Unaimed fire from burp gunners came through the trees overhead. Our mortars fired TOT about 200 yards downstream.

The patrol crept forward, anchored the rope, and provided a covering guard for it. A German 42 MG opened up to the left of the objective. A .50 from our base of fire sent a stream of red tracers in its direction, and the 42 stopped firing.

Holding its fire, the patrol advanced toward the shelter, which could be seen ahead. It was protected by barbed wire. Just outside the entrance was a trench in which stood a sentinel. Hand grenades were lobbed into the trench, and two men jumped into it and captured a prisoner.

The satchel charges were brought up and passed over the wire, but just before the fuse was lighted three machine guns began firing from a communication trench 100 yards behind the shelter. The fire pinned the men to the ground. Artillery concentration Number 6 whistled overhead. The machine guns ceased firing and the fuse on the satchel charge was lighted.

The patrol withdrew to the place where the rope was anchored and returned with the prisoner through the swift, icy water, holding on to the rope to keep heads above water. The Germans began firing with machine guns, and were answered by our .50s along the base of fire. Enemy artillery opened up, and the FO counterbatteried with TOT close-in to assist the withdrawal.

CONCLUSION

The operation was successful because the basic principles of patrolling were followed to the letter. Such principles are usually not intentionally or carelessly overlooked; but often they are not carried out because the tactical situation allows insufficient time to fulfill them.

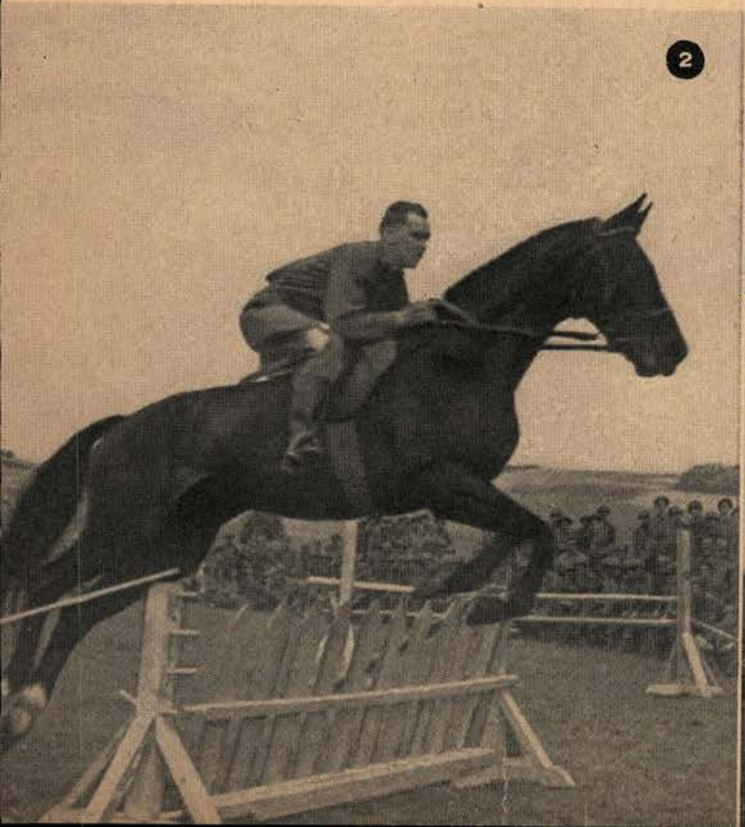
To make a successful night patrol there should be sufficient time: To make a personal reconnaissance; organize a careful plan; select patrol members; brief and allow all personnel to study the ground over which they are to work; and to assemble the equipment.

1

Sunday Matinee in Germany

A Sunday afternoon horse show was held by the 2d Cavalry Reconnaissance Squadron at Neukirchen, Germany, in mid-1945. It was attended by civilians as well as army personnel. Nine silver loving cups were presented to the winners. Many fine horses and excellent jumpers were rounded up for the show. Also included on the program were foreign-make buggies with flowing, fancy fenders, and an exhibition by daredevil Cossacks.

1. Squadron headquarters.
2. Over a jump.
3. Another high jump.
4. Civilians also attended.
5. Cossacks.
6. Judging troopers' mounts.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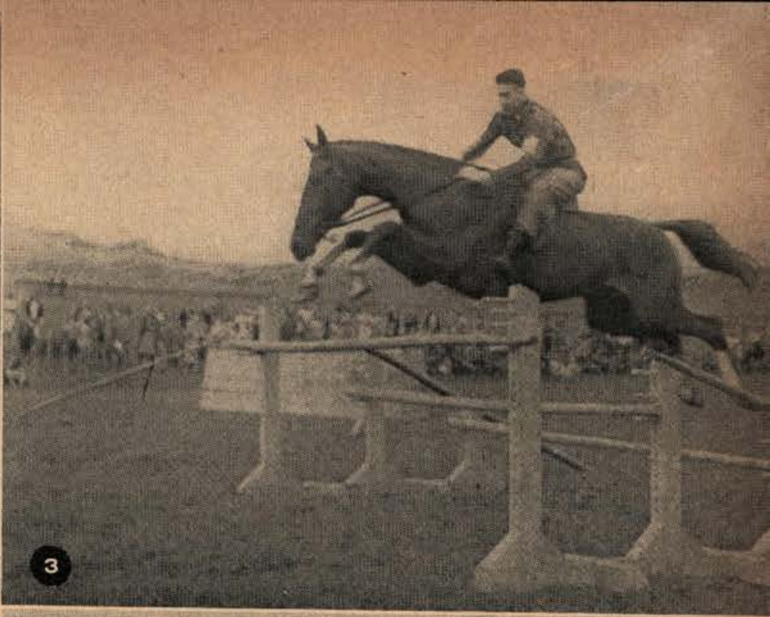
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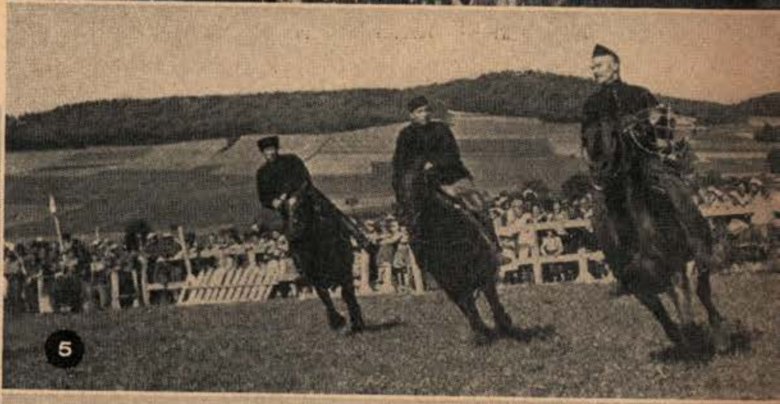
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Horse Cavalry in the Philippines

by Major Harold D. Steward*

I HEARD more than one commander in the 1st Cavalry Division remark on the way to Manila, "I would give anything for a squadron of horse cavalry right now . . ."

Horse cavalry, in the opinion of the writer, would have been highly effective in the Luzon campaigns, and especially successful during the 1st Cavalry Division's drive on Manila in early February, 1945.

The mountains and rugged terrain where roads were either nonexistent or difficult would have been ideal for a mounted cavalry division.

During the drive on Manila by the 1st Cavalry Division, only enough transportation was available to motorize two squadrons of the dismounted division which formed the "flying column" that entered the city. The remainder of the division had to walk. The result was that after each day's advance the gap between the advance elements and the supporting elements became wider. With horse cavalry, spearheaded by tanks, this would not have happened.

As the Japs retreated before the 1st Cavalry Division they blew every bridge along the route to Manila. The American advance was held up while these bridges were repaired in order to permit the attack to continue. Bridges would not have been necessary for horse cavalry.

When the two advance squadrons of the 1st Cavalry Division had entered Manila, they were without reinforcements for more than a day. This occurred because the motorized column moved too fast for the elements on foot, and because the Japs had blown the large steel bridge at Novoliches which made it necessary to build a by-pass for the supporting elements.

Throughout the war in the Pacific, the Japs have used piecemeal attacks, which usually employed one or two companies of infantry, and never more than a battalion. Horse cavalry, which is an arm of speed, could easily have outflanked the Japs when they used such tactics. It could have rapidly brought heavy machine guns and artillery pieces into action on the flanks and in the rear of the enemy. In areas where there were no roads such tactics were impossible for the motorized units, and the foot soldier was incapable of carrying heavy artillery on his back. The surprise from an attack by trained horse cavalry would have resulted in many instances in a Jap rout.

During the fighting in the western mountains of Leyte, the 1st Cavalry Division recruited local horses to be used in pack trains for transporting supplies and equipment to combat troops high in the rugged hills. The answer here would have been pack trains of army mules. Because there were no mules and not enough horses, most of the supplies were carried through the mountains by soldier-pack carriers. The use of combat personnel as pack carriers not only reduced the fighting strength of the division, but also limited the quantity of supplies that could be carried to the troops who were in action.

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*Former 1st Cavalry Division Officer.

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Samurai Swords Commemorate Cavalry Heroes

SIXTEEN historic Samurai swords, for centuries the emblems of Japan's now vanquished military might, are to become a part of U. S. Army traditions. They will be used by the 8th Regiment of the 1st Cavalry Division to establish a new ceremony for the passing of command in its units. The swords were surrendered to the regiment by Japanese military commanders when the 1st Cavalry Division occupied Tokyo.

The new ceremony is designed to keep alive the memory of regimental heroes and those who gave their lives on the long march across the Pacific to Tokyo, and to retell the story of the organization's bloody progress for the benefit of succeeding generations of men serving with the outfit.

A sword bearing the name of a hero from the unit has been presented to each squadron and troop commander of the regiment. Each sword will be known by the name of the officer or enlisted man to whom it is dedicated.

When a commander of a unit is relieved from duty, an appropriate regimental ceremony will be held at which he will present the sword to his successor as a symbol of command. At the ceremony, a brief account of the exploits or death of the man to whom it is dedicated will be read by the regimental adjutant.

"Through this custom, the officers now living, who fought beside those who bled and died, hope to perpetuate their memories and thus hand down to succeeding generations some of the bloody memories and a bit of the glory that was the 8th Cavalry's during those historic days in the Pacific," Colonel W. J. Bradley, commander of the 8th Cavalry Regiment, said in announcing the new ceremonial.

Jungle Pack Operation

CARDED

Time, Inc.

Route of the 5307th Regiment into India and Burma led through heavy, wet jungles, mountain ranges and rivers.

From February 1 to June 1, 1944, the 5307th Provisional Infantry Regiment, a part of Merrill's Marauders, marched 700 miles through the jungle terrain of India and Burma. Heavy weapons and radios, and supplies from air drops were transported by pack animals.

THE 5307th Provisional Infantry Regiment inflicted several thousand casualties upon the Japanese during its campaign in India and Burma. The general plan was to aid the Chinese troops in securing as much room as possible for the Ledo Road. The tactical plan of the Marauders was to operate in the enemy's rear, sever his lines of communication, and force him to attack over ground chosen by the Marauders in order to restore his supply route. This strategy in coordination with the Chinese offensive brought defeat to the Japanese in that section of Burma, and eventually resulted in the fall of Myitkyina.

ORGANIZATION AND TRAINING

The 5307th was a provisional infantry regiment which was organized for a specific type of mission on a special T/O and E. It was based on the "column"—a tactical grouping of weapons and personnel developed by General Ord Wingate for his raid into Burma in 1943. As finally modified and developed the regiment included a regimental headquarters and headquarters company, three battalions, and two quartermaster pack troops whose animals and personnel were divided among the three battalions.

Each combat team contained an infantry company, a reconnaissance platoon, a pioneer and demolition platoon, and a weapons platoon. Heavy weapons, radios, and supplies were to be transported by pack animals, and the regiment was to be supplied by air.

Prior to the opening of the campaign, the 5307th trained intensively for a short time. Although most of the men were seasoned soldiers, they had not worked together as a unit; nor had they been trained in animal care and management, or in pack transport upon which the unit was dependent to maintain a supply level between air drops.

The regiment began training in November, 1943, but various factors forced its employment in combat before it normally would have been committed. It marched down the Ledo Road on February 1, 1944, to begin a 6-month period of almost constant action or movement. *The deficiencies resulting from insufficient training with the pack animals became apparent at once, and constituted a serious handicap to the unit during the campaign.*

ANIMALS

Horses: On January 1, the 5307th received its initial contingent of 700 pack animals, which were recognized as part of the 112th Cavalry mounts from the previous year in New Caledonia. Their condition had declined greatly, but 140 of the best animals were chosen for the 5307th. Two weeks later 200 more horses were obtained from the same source.

There was little time to train and condition the 340 animals. An unknown number had been used as weapons pack animals. It was necessary to break the majority of the animals a second time, however, as they had not been used in many months.

Under normal circumstances, a training program would have been initiated to improve the condition of the animals, train them to willingly accept and march under packsaddle and load, and fit and adjust their individual pack equipment. Because of the exigencies of the situation, such training could not be accomplished. The animals were groomed, fed, and shod, and a few short marches were undertaken which demonstrated their poor condition and the lack of animal training on the part of their infantrymen handlers.

Packsaddles, pads and accessory equipment could not be adjusted until the march down the Ledo Road began, when many of the men led their particular pack animal for the first time. A number of the packsaddles, which were on the animals' backs for the first time, did not fit, and nearly every animal in the regiment developed a sore back. The men were untrained in preventative measures and knew nothing about "chambering" a saddle pad to immobilize a sore back to permit it to heal and consequently the sores grew continually worse.

The poor condition of the horses at the beginning of the campaign, and the lack of care due to inadequately trained animal personnel, resulted in excessive nonbattle casualties. During the campaign the horses steadily lost condition and weight. Most of them died from exhaustion, were destroyed, or killed by enemy fire.

Mules: The 360 mules in the regiment had been trained as pack animals in the States, and were employed with far greater success than the horses. Casualties among them were not excessive. The personnel had been adequately trained, and although the animals were out of condition after the long voyage from the States, the mules actually gained in condition during the opening phase of the campaign. Their average weight had declined at the end of the 700-mile march, but a short rest would have restored most of the animals to a normal condition. The value of the previous training was reflected in the fact that, of the 700 animals which began the campaign, nearly all of the 250 animals which survived it were mules.

EQUIPMENT

The versatility of the Marauders in the employment of their weapons was a factor which contributed largely to their success.

Weapons favored in jungle warfare—where heavy fire fights often occurred at a range of from 40 to 10 yards—were the Thompson submachine gun, the .30 carbine, the M1, the BAR, mortars, grenades, and light and heavy machine guns.

Lack of artillery support was keenly felt during the initial stages of the campaign, and 75mm pack howitzers finally were requested and obtained by air drop. They proved to be excellent weapons for jungle employment and added considerable punch to the Marauders' offensive operations.

ANIMAL EQUIPMENT

Standard animal and pack equipment was used and proved satisfactory. The Phillips cargo saddle was used on the mules, and the *"China Special"* on the horses. The China Special was considered unsatisfactory because it was too small and could not be made to fit. Riding animals were equipped with the McClellan saddle, or the standard packer's riding saddle, full-rigged. Standard adapters and hangers also were used for weapons loads. It was necessary, however, to design and construct hangers and adapters for transporting radios by pack. Animal equipment satisfactorily withstood the hard wear of the campaign. Considerable equipment was lost, destroyed, or abandoned when the animals carrying it became casualties, but that which remained at the end of the campaign was still serviceable and required only cleaning and repairs to restore it.

Mule skinners of the Mars Task Force, operating on a similar mission, lead mules through a river enroute to Bhamo.

Signal Corps Photo

FEED AND FORAGE

General: The regiment depended entirely upon air supply for food, ammunition, and other supplies of all types, including grain rations. Grain was dropped free (without cargo parachutes). The system was dependable, and with few exceptions grain rations were always available for the animals. Near the close of the campaign one combat team missed an air drop. Its animals, already in poor condition, were without grain for 5 days and began to collapse from exhaustion. Even this single mishap was not due to failure of the air supply system.

Grain: Grain rations were drawn from the British and consisted of 8 to 10 pounds of a half-and-half barley and gram (also called "chick" peas) mixture. The gram, when crushed, resembled ground peas. This ration was adequate.

Forage: Until the regiment left the Ledo Road, hay and grain could be drawn from near-by units. One outfit even had a small stock of alfalfa which it shared with the Marauders. Prairie hay also was available occasionally, but it ordinarily had been chopped fine and compressed into small bales. In feeding it was necessary to spread it on the ground which resulted in excessive waste.

Green Forage: Plenty of green forage was available along the 700-mile route of the 5307th. It was of sufficient quality to add the required bulk to the animal diet. Both horses and mules developed a great liking for green bamboo tops. The men cut them and the animals ate all they could get.

Packing: Only a few more than 200 men in the regiment were trained in the techniques of pack transportation and animal management. They were largely responsible for the successful employment of the 700 pack and riding animals. Since in the jungle it was a full-time assignment for one man to be responsible for one animal, it was necessary to detail infantrymen as mule skinners. Experience was a hard teacher but, as the weeks passed, doughboys learned to tie lash ropes with knots that would not work loose and to pack loads which would stay on the saddle. They gradually came to understand their animals, their individual characteristics, capabilities, and limitations.

Packmaster: The duties of packmasters were heavy and manifold, particularly at the beginning of the campaign. During the march, packmasters moved up and down the column to check the lashing and balance of loads, and the fit and adjustment of equipment. It often was necessary to lead an animal off the trail, unload his cargo, adjust the saddle equipment to prevent a sore back, and replace the load. The doughboys attended pack school beside the trail as packmasters explained the adjustment of a saddle pad or demonstrated how to balance and lash a particular type of load. When bivouac was established at night, the packmasters' working day continued. Saddles were adjusted, pads were fitted, and equipment was swapped from one animal to another in order to achieve a proper fit. Another nightly task was to chamber the pads to facilitate healing of the numerous sore backs. The packmaster also supervised the care of the animals, and since the doughboys were unfamiliar with such details, a considerable amount of persuasion, instruction, and demonstration was required to convince a trail-weary infantryman that it was necessary to feed, water, and groom the animals and examine their feet prior to opening his own rations. The packmaster's duties became somewhat less stringent as the campaign progressed and the inexperienced packers became familiar with their duties.

Signal Corps Photo

Soldiers lead pack mules through a trench up a 1,200-foot slope to a supply dump. Note plane in upper left corner.

Cargador: The duties of the cargadors were equal to those of the packmasters. Each night, they supervised the unpacking and stacking of cargo and equipment, and planned the assignments of cargo for the next day's march. The cargadors also acted as saddlers, and repaired broken animal equipment. Each morning when the cargo was packed, they assigned loads to individual animals and supervised the preparation, loading, and lashing of the cargo. The cargador also assumed the duties of the packmaster during the latter's absence.

Loads: Hanger loads consisted of weapons, radios, and ammunition. General cargo loads were made up of ammunition, rations, medical and other supplies. In addition, each animal also carried his own grain ration. Loads for horses weighed 150 to 200 pounds, for mules from 200 to 275 pounds. The lower weight was preferred.

Marches: On marches there was no pack train in the usual sense. Normal provisions were made for security, communication, and control, and these were adapted to meet whatever circumstances were imposed by terrain and the situation. Pack animals were as much a part of the platoons as the weapons and supplies they carried. A man was assigned to lead each animal since it was not practicable to attempt herding. Neither was it possible to tie two or more animals' heads and tails together, for they invariably became tangled in the heavy undergrowth.

Terrain: The terrain traversed during the 6-month campaign often was difficult, and demands were severe upon the physical strength of man and animal. The topography included rivers, swamps, and 6,000-foot mountains. After April, the outfit seldom was dry and was seldom out of the mud. Animals frequently bogged down and it became necessary to unload the cargo, remove the saddle, and haul them out bodily. Consequently, the rate of march was variable. It was almost impossible to conform to a schedule, and distance was customarily estimated by time rather than miles.

Jungles: The Burmese jungle was of three general types. Virgin growth, or "primary jungle," consisted of giant trees and thick undergrowth through which it was necessary to cut trails. Visibility often was less than 10 feet and sunlight seldom touched the ground. Secondary jungle was less thick, and only an occasional vine had to be cut to clear a trail. Clearings (savannahs) were not infrequent and there were occasional patches of sunlight on the ground. Marshes were encountered along the rivers. Many of them were, for practical purposes, impenetrable to man or beast and had to be by-passed. Jungles of all types were generally heavier in the valleys, thinned out on the ridges, and sometimes opened into areas of tall grass. Rainfall, which was relatively light during the earlier part of the campaign, became excessive after May 1. The Marauders seldom were completely dry thereafter until Myitkyina was taken. Contrary to expectations, they saw but few animals and occasionally a snake, but insects and leeches were a constant nuisance.

Mountains: The mountains constituted almost impassable obstacles. Men and animals were frequently injured when they fell down steep grades. Making a passable trail for animals meant grueling labor. Often it was necessary to dig trails in steep shoulders, and to cut steps to aid the animals in climbing. Men placed their shoulders to the rumps and bellies of the animals and pushed and heaved to help them take another step. The men were amazed at the agility of the mules, who were able to make their way where men had to use their hands to climb. In such terrain, it was essential that the work of the preliminary trail reconnaissance party be coördinated with that of the pioneer parties in order that trail improvement could be made ahead of the moving column.

Bivouacs: The Marauders habitually established their bivouac as a perimeter defensive position. While preparations for the night's bivouac were in progress, packers unloaded cargo and stacked it under cover. They then left the picket line, at which a guard remained, and put up their shelters for the night. Packsaddles were left on the animals during this period so that circulation would gradually return to the pressurized areas of their backs. The men then returned to the picket line, removed the packs, watered and fed the animals, and groomed them if darkness did not intervene. If circumstances prevented grooming at night, the animals were groomed the next morning. During this period the packmaster examined the animals and sent those requiring attention to the veterinary officer.

LESSONS LEARNED

1. Troops who participate in jungle warfare must be in top physical condition. Otherwise, the hard physical work and the damp heat will soon wear the men to the point of exhaustion.

2. As it is conducted in the United States, training in animal management and the technique of pack transportation is sound. High animal losses during the Marauders' campaign were due, not to a lack of training doctrine, but to a lack of training and lack of time to condition animals.

3. Pack operations in the jungle are entirely feasible if:

   a. Men and animals are in top physical condition.
   b. Packers are thoroughly familiar with the technique of pack transportation and animal management.
   c. Equipment is correctly adjusted to individual animals.
   d. The unit which is being supported by pack transportation plans its operations with due consideration for the capabilities and limitations of its accompanying pack train.

4. Infantry units which employ pack transportation should train with pack animals. Unless this is done, the animals will not become properly conditioned nor will the troops become accustomed to including the animals in the scheme of operations. More than a few men should be experienced with animals. All men in charge of animals must be fully trained in their care and management, and indoctrinated with the necessity for giving them the best possible care under all conditions. Infantry officers in command of such units must have a thorough understanding of animal care.

5. The Phillips cargo saddle is too heavy, although it is excellent in all other respects. In rough terrain, breast collars are necessary and, where feasible, hangers should be provided for all standard loads so that the weight may easily be taken off the animal's back at short and indefinite halts.

6. Any change from hay to green forage should take place gradually to avoid diarrhea. Bamboo leaves are an excellent green forage.

7. Animals should be clipped prior to operations in hot climates. An adequate supply of pine tar should be kept on hand for treatment of open wounds and cuts, to prevent the entry of screwworms.

8. A combination of air supply and pack transportation is an excellent means of supplying rapidly moving troops. Packages of rations, medical supplies, and other items are of ideal size and weight to load on pack animals without further preparation.

Outguessing the Enemy*

by Captain W. H. Whyte, Jr.

In the fog of war, we seldom know enough about the enemy. We must not fool ourselves that we can guess what he will do, but stick to learning his "capabilities."

THE Japanese General, as he pored over maps in his Bougainville headquarters, was a very puzzled man. He was sure the Americans' next move would be a landing on Bougainville. The big question was where. In view of the tremendous stretch of vulnerable coast line this was quite an order for any G-2, but he was up to it. After a thorough study of terrain, hydrography and his past (and disastrous) experience with the Americans, he decided that the landing would undoubtedly be made at Gazelle Bay on the west coast.

His men feverishly prepared beach defenses and strengthened their Gazelle Bay garrison to meet this expected invasion. It is more than possible that one day an excited runner rushed into headquarters with an American officer's dispatch case which had been found in the bush along the coast southeast of Gazelle Bay. The Yankees had obviously been reconnoitering the area! As the writing in the officer's notebook was translated, we can imagine the "I told you so" smirks that came over the Japs' faces, for the American had stupidly jotted down his orders—orders to patrol the area to determine the best landing beaches.

But when the landing came, it was at Torokina, 15 miles to the north in an area lightly defended. However, the Jap commander was not this easily fooled—the Torokina landing was obviously a most clever diversionary move, so he kept his men at Gazelle Bay in readiness for the main landing.

As we know, it was never to come off, for, as had been planned all the time, the 1st Marine Amphibious Corps poured everything into Torokina. The captured notebook with the Gazelle Bay landing plan? It was prepared by the Marine G-2 and deliberately left behind by the amphibious patrol for the Japs to find. Actually, we cannot be sure that it was retrieved by the enemy, but we can be sure the Japs' belief that they had correctly divined our intentions cost them dearly.

Human nature being what it is, rare is the person who doesn't secretly feel himself endowed with a profound perception of other people, with instinctively correct hunches as to their probable behavior in a given set of circumstances. True, some of our predictions may have gone wrong, and we may have lost an election bet or two, but they were "exceptions." Thus, confronted with a rather foggy situation in which we, as platoon leader or division G-2, should make an estimate of the enemy, our natural instinct would be to avoid the routine job of objectively reviewing all our information and going to work with a map and a pair of dividers. It would be so much easier to put ourselves into the enemy's shoes to determine his probable intentions.

The Japs on Bougainville tried it and failed. In an even larger sense their fateful and now much-regretted decision to launch the Pearl Harbor attack was the result of paying too much attention to what the "decadent" Americans probably *would* do, and too little to what they *could* do. The German General Staff, if they get the opportunity to compile a manual of their mistakes in this war for future reference, might say "Amen" to this.

One might reply that the Germans and Japs, and often ourselves, simply made bad guesses—poor applications of a perfectly sound principle. What, then, is wrong with the theory of "intentions?"

In estimating intentions we're starting out on a line of deductive reasoning. On the basis of incomplete information we arrive at a premise—i.e., "The enemy always attacks over the worst terrain." Then we continue our deductive reasoning by applying this premise to individual cases; i.e., "Gongo Swamp is the worst terrain around; therefore the enemy will attack through Gongo Swamp." However, in deduction, our conclusion is valid only if the premise is absolutely correct. If it isn't we're liable to be in hot water.

Because we realize that in the fog of war we rarely know enough about the enemy to justify making sweeping generalities and premises that will hold true in all cases, we prefer the method of inductive reasoning, the method by which we let the facts point to the conclusions rather than taking a conclusion and finding facts to support it.

We go even further in admitting our shortcomings, for we know that in inductive reasoning the conclusions are only probable, the extent of probability depending

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*Courtesy, *Marine Corps Gazette,* November, 1945.

on the amount of facts we have. Thus, in making our estimate of the enemy situation, we don't fool ourselves that we can determine what he will do, but more modestly stick to finding out which is the most probable of the things he *can* do. This is the system of "capabilities."

With what information we have of the enemy and the terrain, we consider what general courses of action he could physically carry out, however stupid or tactically unsound they might seem. Some of these courses wouldn't hurt us in the least, and might be just what we want him to do. While we are naturally curious about anything the enemy may be up to, first things come first, so we concentrate our attention on those of his courses which, if adopted, would interfere with the accomplishment of our mission, these being classed as his "capabilities."

As an example, let us take over the job of the S-2 of the battalion which has just arrived at 1400 in Buzu Woods, as shown in the drawing on this page. Our mission is to seize Mugo Ridge, currently occupied by what appears to be a company of unreconstructed Japs. H-hour has been set at 0800 tomorrow. What are the enemy's capabilities?

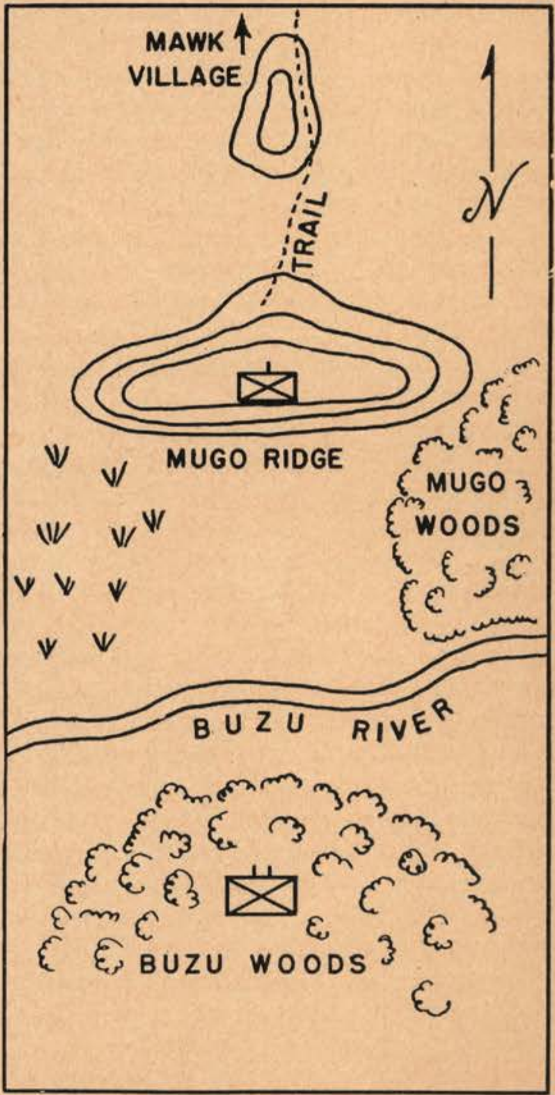
If he withdrew, we would be delighted. Such fortuitous action on his part would not hinder our job at all, so it is not a capability, although it would quickly become one if regiment told us to "destroy" that particular group of Japs. They can chiefly hinder our mission by defending the ridge. This is the obvious capability, and many would feel it the only one. But although they are not supposed to, since we are all set to attack, they *could* stage an attack of their own. Illogical as it might seem, it is a capability, just as was that of a German attack against our forces in the Ardennes sector last December.

If there were another company of Japs at Mawk Village to the north, we would add the capability of their reinforcing the unit now on Mugo Ridge. We would not qualify each capability according to a possible reinforcement build-up, for that would run into a regular geometric progression, but would state it as a separate capability common to the others.

So far we have examined the "what," but we must also consider the "where," and "when," and the "in what strength"—and this is where the trouble begins. The G-3, in making his time and space calculations for our own operations, includes reasonable allowances for all time-consuming factors such as the transmission of orders, reconnaissance and so on. Time and space calculations on the enemy, however, must be based on assumptions of complete preparedness, maximum speed and perfect operational efficiency. At the beginning of the war with Japan we tended to go a bit overboard on this and credited the Japs with being pocket-sized supermen, their transports of limitless capacity, and rough terrain their first love. We soon learned, however, that the Nip was no better with the machete than we. By the end of the war we could estimate rather closely the time and space factor of his capabilities. To overestimate the enemy, while perhaps not as dangerous as underestimating him, is to rob ourselves of many chances for quick and decisive action.

To get back to Mugo Ridge, let us continue the situation, keeping in mind the importance of determining the "where," "when," and "in what strength" factors. Our mission has now been changed to that of holding Buzu Woods—the Jap company at Mawk Village has finally marched south to reinforce the company already on Mugo Ridge. Continuous aerial reconnaissance has spotted no movement, and patrols in Mugo Woods were negative as of 1530. It is now 1700. What are the enemy capabilities?

Assuming that we have closely computed the rate of march through the swamp and jungle, we find that he can attack us with two companies on our front any time after dark; our right any time after 1900; our left any time after 2200; and our rear any time after 2400. Either a defense or withdrawal on his part in this instance would not be a capability, since it would not



What are the Japanese capabilities here?

interfere in any manner whatsoever with our mission.

But, you might say, is that all he could do? Could he not attack our left with a platoon, hit our front with another, and then envelop our right rear with the bulk of his force? Or couldn't he feint on our right with two platoons and launch his main attack straight across the river . . . or a feint on our left . . . and so on, ad infinitum?

Since the variations of the enemy's main capabilities are endless (not going beneath platoons in this instance, since there are over 200 "sub-capabilities") it is obvious that to go into the ramifications of each general course would be an impossible task. Accordingly, we concern ourselves chiefly with what the enemy will do with his *main body*.

Now let us take the same situation and examine it through the eyes of the one who believes in "outguessing" the enemy—of trying to determine his intentions. The battalion S-2, being a modest fellow, admits that while he knows what the Nips can do, he does not know what they *will* do in the next 24 hours. At the CP is Captain Hotshot, "an old Jap fighter," who has no doubts whatsoever that he can dope out what the enemy is up to by the simple process of placing himself in the enemy's shoes. "Easy, Lieutenant—so I'm over there on that ridge. I've got two companies. The Americans have a battalion. I've got a swell defensive set-up—good high ground—grazing fire to my front, as well as a river. There's a swamp protecting my right flank . . . I've got a swell route of withdrawal if things get too hot—couple of good spots for a delaying position between the ridge and Mawk Village. By defending I've got everything to gain and nothing to lose. If I attack a battalion with two companies, I'm crazy. And let me tell you something, Lieutenant, I know these Nips pretty well, and they're not crazy. Take it from me, those babies are going to sit on that ridge."

Captain Hotshot, rather pleased at this searching analysis of the situation, is temporarily discomfited by the sudden appearance of Sergeant Jones, just back from patrolling Mugo Woods. The sergeant's patrol had run into a group of Japs hacking a large trail up to the banks of Buzu River. By cross-examination, however, Captain Hotshot finds that the Japs were jabbering away merrily when the patrol spotted them! "Simple! Plain as the nose on your face—they were staging a demonstration to make us think an attack is coming up—the fact that they were making so much noise gives 'em dead away." Here Captain Hotshot permits himself a patronizing chuckle. "Well, that might fool some people, but they'not not fooling this bird. I know what makes these Nips tick."

Fortunately, since this is a hypothetical case, we can actually find out what is going on over there on Mugo Ridge. For one thing, Captain Ichimura, a first class officer, was killed this afternoon by a mortar shell, and the company commander of the outfit, just arrived from Mawk Village, is 1st Lieutenant Sugiyama, a fireball of limited intelligence. Yesterday afternoon he was severely reprimanded by the battalion commander for his company's being the worst in the battalion, so Sugiyama is naturally anxious to redeem his good name as well as the company's. On the basis of reports from patrols and observation posts, he estimates the strength of the Americans on the other side of the river to be approximately a reinforced company. It does not give him much margin of superiority, but as he is an unusually skillful tactician, and as one Jap is worth 10 Yankees, he knows he can annihilate them. Accordingly, he has sent out a trail-blazing patrol to prepare the way for a forced night march to turn the enemy's right flank after which one good banzai charge will do the trick.

Far fetched?

Delve into the background of any Japanese campaign in the past war and you will find that they, like ourselves, often made plans on the basis of inaccurate information, improper evalution, poor terrain analyses, and these plans, good or bad, were changed at the very last minute. So how in the world, with even the best of information, can we tell what the enemy is going to do when frequently he does not even know himself?

At the battle of Frederickburg, Lee was about to deliver on Burnside's badly disposed Union forces an attack which gave every promise of success. Just then he was given an order of Burnside's, that had been captured—an order which revealed Burnside was planning to attack the next morning. Stonewall Jackson was all for attacking immediately, but Lee decided, on the basis of this document, to postpone the attack and lay a trap that would catch Burnside when he ventured forth the next morning. As luck would have it, Burnside changed his mind and withdrew, thus robbing Lee of what perhaps had been his best opportunity to destroy the main Union army.

Lee, of course, was taking a justifiable military gamble in postponing his attack, but it is an illustration of how impossible it is, even under the best of circumstances—such as the capture of the enemy's plan—to determine ahead of time exactly what the enemy *will* do.

In this connection we should avoid deducing the enemy's mission, for it is simply another way of estimating "intentions." The Japs, having "G-2d" the marines' Bougainville beaches with a conspicuous lack of success, apparently still believed themselves up to reading our minds, for they decided that the U. S. mission was to conquer the entire island. Thus, while the marine beachhead was being consolidated, they refrained from attacking it with any sizable force, but rather strengthened the defenses of the island's various garrisons. When it later became evident that the marine mission had been to establish a perimeter to defend newly constructed airfields, the Japs mounted a full scale attack, but too late to have any real chance of success against the perimeter, now well dug in.

Obviously no commander is greatly helped in making a decision by a mere list of what the enemy *can* do. In calculating his best course the commander wants to know what is the most probable enemy capability. In determining this priority, the primary consideration is the disposition of the enemy forces—which course is he best located to carry out? In the case of the Japs on Mugo Ridge, if our reconnaissance indicated that the bulk of the force had moved to Mugo Woods during the night, we would be justified in listing an attack on our right as the most probable. True, it might be a feint, but if we get too subtle about it we could never determine anything.

The biggest pitfall in estimating probability is to analyze the terrain to determine which course it favors most. The fallacy of this reasoning lies in the fact that the enemy, in making his dispositions, has *already* made his terrain analysis. Our terrain analysis might be better, but he is placing his troops on the basis of *his* evaluation, not *ours*. That is the reason why, in estimating the probable order of the capabilities, we are guided primarily by the enemy's dispositions rather than by the terrain.

Dispositions are the basic consideration in estimating priority of capabilities, but there are 4 other factors that can influence our choice of the most probable enemy course. These are: the enemy's tactical doctrine, his recent performances, national psychology, and the character of the hostile commander.

Among the armies of the world, Field Service Regulations vary little, lip service being paid to all of the standard tactical principles. Past enemy performances, however, reveal which of these principles the enemy customarily puts most emphasis on, and which of them he honors in the breach. In respect to the Japs we found that despite their Staff Manual's warnings against uncoördinated offenses, piecemeal attacks were the rule rather than the exception.

The national psychology of the enemy nation frequently may point to an indication of priority. Intelligence officers early learned that they could often expect a full-blown banzai charge on the anniversary of the Emperor, Meiji, even when the situation called for considerable Nip circumspection.

In like manner our intelligence agencies must constantly be striving to learn as much as possible of the character of the officers of the armies of the world. The obscure second lieutenant of today may be the general opposing us tomorrow. Is he rash? Is he cautious? Does he love a good party . . . liquor? Patient detail work now may provide one of our future commanders with character analyses that will help him keep one jump ahead of the enemy. George Washington, one of the most intelligence-minded of all our military leaders, was always anxious to find out as much as possible of the character of his opponents. His awareness of Lord Howe's dilatory ways enabled him to escape defeat more than once when they met in the field. In using these 5 factors affecting the priority of enemy capabilities, the big temptation is to slight dispositions, develop a "pet theory" as to what the enemy *will* do, and then rationalize it on the basis of tactical doctrine, psychology and so on. This form of reasoning becomes, in effect, that of "intentions." We must remember that the basic consideration in determining the most probable capability is the known disposition of the enemy; in other words, which course is he best disposed to carry out?

To sum up: on the basis of the last known enemy situation we consider all those courses of action of which he is physically capable, examine them in the light of our mission, and class those which would interfere with our mission as capabilities.

In stating these capabilities we determine as closely as possible the time, the space and strength factors—when (usually the earliest time) he can carry out his course—where—and in what strength.

While we give the enemy the benefit of the doubt to avoid being surprised, we nevertheless use all the information and background material we have available to narrow down the time, space, and strength factors so that we will not overestimate him and thus lose many opportunities for success.

Whenever possible, usually on the basis of the enemy's dispositions, we determine his most probable capability. However, we avoid at all costs becoming so engrossed with this that we forget other courses of which he is still quite capable.

The atom bomb, the new complexion of warfare, may make our time and space charts of today soon useless, but they reinforce the importance of the doctrine of capabilities. Let us lull ourselves into believing we know what potential antagonists will do (often synonymous with what we want them to do), and we may be awakened by a triple-atom, jet-propelled, television-controlled, Buck Rogers device that was not on our list of capabilities.

Once you feel sure that you *know* what the colonel sitting across the river from you is going to do tomorrow morning, just remember that if you are a normal human being you have sold yourself a bill of goods. From that point on, unless you have an extraordinarily well disciplined mind, it is going to be easy for you to find material to support your conviction. Recall our political campaigns—how one orator can take a set of facts and prove to his and others' complete satisfaction that Candidate X is a veritable devil, while another orator, with exactly the same set of facts, can by different emphasis, selection and interpretation prove that, quite to the contrary, Candidate X is a saint.

With the system of capabilities we are not out to *prove* anything. We follow it to guard against snap judgments, preconceived opinions, overconfidence in our powers of foresight—and with it to keep our minds completely open.

21st British Army Group in Europe, 1944-45*

PART I

The following article is a lecture given by Field Marshal Sir Bernard L. Montgomery to the Royal United Service Institution, and gives a comprehensive story of the part played by the 21st British Army Group in a major campaign. As its commander, Field Marshal Montgomery tells of the problems and how they were solved as well as the strategy behind the over-all military plan. This story will be concluded in Part II in the next issue of The Cavalry Journal.

by Field Marshal Sir Bernard L. Montgomery, G.C.B., D.S.O.

IT is essential to begin by saying that in modern war every operation is combined; no single service completely predominates all the time. In the initial stages of this campaign the object was to secure a lodgment on the Continent from which further offensive operations could be developed; this was clearly a combined operation of the first magnitude.

Before the operation was launched it was the task of the air forces to create conditions favorable to a successful landing and to the subsequent development of operations inland. Both the army and the navy relied on this being done, and it was done; the heavy bombers of Bomber Command and of the American Air Force did magnificent work in weakening Germany generally, and in particular in destroying the enemy railway system, which enormously reduced the mobility of the enemy once operations began.

Until the army stepped ashore it was completely in the hands of the navy and air forces for its sea and airborne landings.

Once the army was on shore all military operations became combined army/air operations; the mighty weapon of air power enabled the army to conduct its operations successfully and with far fewer casualties than would otherwise have been the case. The army relied on the navy and on the air forces for secure communications across the sea from our island base in Britain.

As a soldier I would like to say that the army owes a great debt of gratitude to the navy and the air force and realizes fully its complete dependence on them in all military operations. I feel certain that sailors and airmen will agree that the contribution of the army to the successful conclusion of the German war was up to standard.

This campaign involved the whole problem of the conduct of offensive operations on land in Western Europe with the final object of destroying the enemy's armed forces and occupying Germany. The army had got to carry out this task; it is obvious that no other service could do it.

Therefore the first need was to decide how the operations on land were to be developed so that the object could be attained in the simplest and quickest way. It was then for the navy to say whether the army could be put on shore in such a way that the land battles could be developed in the required manner; and it was for the air force to say whether this would suit the air plan. And so the combined plan was built up; some compromise was necessary and this will always be the case; but eventually, and very quickly, an agreed plan emerged.

Before passing on to describe the plan and the operations, I must pay tribute to the splendid teamwork that was built up by the Allies in this campaign. Under the Supreme Commander, General Eisenhower, the various components of the great force involved were welded into a fine fighting machine. "Allied Solidarity" was the keynote of our policy, and it was achieved in no uncertain manner.

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*The Journal, Royal United Service Institution.

From now on I shall confine myself to the purely military side of the campaign, and I should like to remind you that in relating the action of the soldiers, I speak not only of the American, British and Canadian forces, but also of the contingents of Belgians, French, Dutch, Poles, Czechs and other Nationals which were included in the 21st Army Group, all of whom played their part with distinction.

THE PLAN

The intention was to assault, simultaneously, beaches on the Normandy coast immediately north of the Carentan estuary and between the Carentan estuary and the River Orne, with the object of securing as a base for further operations a lodgment area which was to include airfield sites and the port of Cherbourg. The left or eastern flank of the lodgment area was to include the road center of Caen.

General Eisenhower had placed me in command of all the land forces, British and American; I was in fact his land force commander.

Once ashore and firmly established, my plan was to threaten to break out on the eastern flank—that is in the Caen sector; by this threat to draw the main enemy reserves into that sector, to fight them there and keep them there, using the British and Canadian armies for the purpose. Having got the main enemy reserves committed on the *eastern* flank, my plan was to make the break-out on the *western* flank, using for this task the American armies under General Bradley, and pivoting on Caen; this attack was to be delivered southward down to the Loire and then to proceed eastward in a wide sweep up to the Seine about Paris. This would cut off all the enemy forces south of the Seine, over which river the bridges were to be destroyed by air action. The general plan was given out by me to the General Officers of the field armies in London in March, 1944—that is, three months before D Day. The operations developed in June, July and August exactly as planned. I had given D + 90 as a target date for being lined up on the Seine; actually the first crossing of the river was made on D + 75.

Why did we select the Normandy beaches? They offered a better shelter for shipping and were less heavily defended than other possible beach areas along the Channel coast. They satisfied the minimum requirements of the air forces, in terms of their distance from home bases, for the provision of air cover. The absence of major ports was overcome by the gigantic engineering feat of constructing two artificial ports in the United Kingdom which were towed across the Channel in sections and erected, one in the United States sector and one in the British sector. In spite of considerable damage during the unprecedented June gale, the port at Arromanches in particular proved a great success.

The invasion operations may be said to have begun with the action of the air forces. The first stage was the winning of the air battle, an essential preliminary always to all major offensive operations. This task was admirably accomplished. As D Day drew nearer, attacks were delivered against coast defenses along the whole length of the Atlantic Wall. Meanwhile, prevention of enemy air reconnaissance during the period of concentration of the invasion forces was highly successful, and contributed towards the gaining of tactical surprise. Naval operations were intensified against E-boats and U-boats as the great day approached.

THE ASSAULT

My plan of assault, as approved by the Supreme Commander, provided for simultaneous landings by 8 equivalent brigades—of which three were British and two were Canadian brigades, and three were American combat teams. With the assaulting brigades, two battalions of U. S. Rangers and portions of two British commando brigades took part. The Americans assaulted on the right flank as they would ultimately require direct entry of personnel and stores from the Atlantic.

Airborne forces were used on both flanks. On the right, the 82nd and 101st U. S. Airborne Divisions dropped at the base of the Cotentin peninsula to assist in capturing the beaches and isolating Cherbourg. The 6th British Airborne Division was given the task of seizing the crossings over the Caen Canal and of operating on our extreme left.

The first task of General Bradley's forces was to cut off the Cotentin peninsula and seize Cherbourg. Operations would then develop southward. The British forces, under General Dempsey, were to make straight for Caen to establish the pivot.

It is important to mention the subject of build-up. I considered it essential for the success of initial operations to have ashore and ready for action by the end of D + 3, 7 divisions together with the necessary proportion of armor, quite apart from the airborne troops. With these forces I was confident of being able to defeat the first German attempts to dislodge our forces and also of being able to retain the initiative.

THE BATTLE OF NORMANDY

The assault on the beaches of Normandy began on June 6, 1944. Airborne forces were dropped first; then from a mighty armada of ships and craft, preceded by a tremendous weight of bombing from the air, American, British and Canadian troops set foot again in France.

Despite the enemy's plan to defeat us on the beaches, there were no surprises awaiting us, and our measures for overcoming the formidable array of obstacles and beach defenses were effective. The secrecy of our operations, and the special measures taken to mislead the enemy, had achieved a great measure of tactical surprise —and in the circumstances we could not hope for more. Moreover, our losses were lighter than we had expected.

Within a week the beachheads had successfully linked up, and along the continuous front Allied troops were engaged in heavy fighting in the difficult *bocage* country. Adequate stocks of ammunition and supplies had been accumulated, and our build-up was proceeding well. We had gained a strong foothold; we had suffered no setbacks; we had maintained the initiative.

Having first isolated the enemy forces covering Cherbourg by a thrust across the base of the Cotentin peninsula through St. Sauveur, the Americans turned north to deal with Cherbourg. The port was captured on June 26.

Meanwhile, the Second British Army was continuously engaged in fierce fighting round Caen, where the bulk of the enemy armor was committed. By the end of June there were 6 Panzer divisions involved on our eastern flank with a further Panzer division expected.

The Break-Out

In early July, the First U. S. Army was gaining position for the break-out from the initial lodgment area. Operations centered in the La Haye du Puits sector and in the capture of St. Lô. Meanwhile, the business of locking up the enemy armor on the eastern flank continued.

Preceded by a highly successful bomber raid, when for the first time aircraft of Bomber Command operated on the tactical battlefield, we entered Caen on July 9. In order to increase the enemy's anxiety in this sector by threatening armored action in the open country southeast of Caen, I now withdrew three armored divisions into reserve. The enemy responded suitably; the bulk of his armor remained where we wanted it.

The Second British Army now extended its front farther west in the Caumont sector in order to increase the striking force available to the First U. S. Army. The First Canadian Army (under General Crerar) took over responsibility for the extreme left sector on July 23. The stage was thus set for the break-out from the western flank.

On July 25 the main American attack started in the sector between Periers and St. Lô. The Eighth U. S. Air Force was employed in the tactical rôle and dropped a carpet of bombs immediately in front of the leading troops as a preliminary to their advance. The advance was highly successful; Avranches was taken on July 30. The VIII U. S. Corps, under command of Headquarters Third U. S. Army (General Patton), was then directed into the Brittany peninsula. With the entry into the field of the Third U. S. Army, Headquarters Twelfth U. S. Army Group (General Omar Bradley) assumed command of both American armies. The Twelfth U. S. Army Group remained under my operational control.

The enemy was trying to recover his balance as the powerful American attack pushed back his left flank and began to swing southeast and east. He tried to stabilize a front on "hinges" at Caumont, on the Orne, and on the high ground between Caen and Falaise. One by one the hinges, or "key rivets," were successively knocked out by the British armies working from west to east as the attack of the American armies on the west flank gathered momentum.

By August 6 the area Laval-Mayenne-Domfront had been reached and on the following day the First Canadian Army, which had now extended its front to include the Caen sector, began a series of major attacks astride the Caen-Falaise road.

This was an exciting time, as it was now to become apparent whether the enemy would stand and be defeated between the Seine and the Loire or whether he would endeavor to withdraw his forces behind the Seine. Between August 7 and 11 it became clear that he had decided to fight the Battle of France on our side of the Seine. On the 7th a major counterattack employing up to 6 armored divisions was launched on Hitler's orders against the American forces in the area of Mortain. It was designed to cut off the forces operating south of Avranches by a drive to the sea. In the face of this counterattack the Americans, assisted by the full weight of the tactical air forces, stood firm.

I ordered the right flank of the Twelfth U. S. Army Group to swing north towards Argentan, and intensified the British and Canadian thrusts southward to the capture of Falaise. It had become a race to trap the German forces deployed in the long salient between Falaise and Mortain. Meanwhile, the enemy received a tremendous hammering from the air.

Falaise fell to the Canadian Army on August 16; American forces had reached Argentan, and fighting of tremendous intensity was in progress at the bottleneck with the German striving all he knew to force his way out.

Speedy regrouping of the Twelfth U. S. Army Group front, combined with outstanding administrative improvisation, enabled the advance eastward of the Third U. S. Army to continue *while the battle of the Falaise pocket was still in progress.* By August 20, troops of General Patton's army reached and crossed the Seine in the area of Mantes and began to work westward along the river towards Elbeuf. While American, Canadian, French and Polish troops held the neck of the bottle, the Second British Army and First U. S. Army, strongly supported by the tactical air forces, overran and eliminated the trapped enemy. The other armies of the 21st Army Group then began the race to the Seine. They quickly reached their sectors on the river; tremendous execution was done by the air forces, particularly at the Rouen ferries.

After the Battle of Normandy

Here I will pause for a moment to discuss the enemy situation as a result of the Battle of Normandy. The losses sustained by the Germans were truly tremendous. Of his Army, Corps and Divisional commanders, 20 had been killed or captured and two others wounded. The supreme German commander had been changed twice. Of his fighting troops, 43 divisions had either been eliminated or very severely mauled, apart from those locked up in Brittany and the Channel Islands. His losses in killed, wounded and prisoners were not far short of half a million men. His material losses were equally severe; some 1,500 tanks were destroyed and 3,500 guns were either destroyed or captured.

The Battle of Normandy had conformed to the pattern decided upon before D Day. There was nothing the enemy had been able to do which ever upset this plan, and there was never a moment in which we had not firmly held the initiative. The massive counterattack which we had always taken into consideration in our plans before the invasion never materialized in the earlier stages. He had been forced to use his Panzer formations to plug holes in the line in response to our thrusts. He was not able to launch a main stroke with them until after we had broken out of our original bridgehead. It was then too late.

The Drive to Antwerp

On September 1 the Supreme Commander assumed command and direction of the Army Groups himself, and I was no longer, therefore, his over-all land force commander. From now on my story will be primarily concerned with the 21st Army Group proper, that is, with the British and Canadian forces, together with the various Allied contingents which served with them.

In considering the development of the strategic plan after crossing the Seine the primary object, of course, was the destruction of the German Army. As a result of discussions between the Supreme Commander and myself, from now on the eventual mission of the 21st Army Group became the isolation of the Ruhr. The urgent problem was to prevent the enemy's recovery from the disaster sustained in Normandy. A major consideration was the administrative situation created by our ever-lengthening lines of communication. My administrative staff had, however, been building up reserves during August in order to support the pursuit. Imports were cut by 60 per cent in order to release a considerable quantity of transport from beach and port clearance for forward maintenance purposes.

The immediate tasks of the 21st Army Group were:—

(*a*) the destruction of the enemy in northeast France,
(*b*) the clearance of the Pas-de-Calais with its V-bomb sites,
(*c*) the capture of airfields in Belgium, and
(*d*) the capture of Antwerp.

Between August 25 and 30 the Second British Army and First Canadian Army crossed the Seine, in most cases without serious opposition. The 4 Allied armies now started advances which were eventually to bring them to the Rhine on a very broad front.

On the right of the Third U. S. Army, having concentrated east of Paris (which was liberated on August 25), was striking eastward during the first week of September to Nancy and Verdun. Shortly afterwards another column was directed southeast toward the Belfort area to join up with the Seventh U. S. Army approaching from Marseilles.

The First U. S. Army advanced over the Aisne with its right flank directed on the Duchy of Luxembourg and its left flank on the general axis Mons-Liége.

The second British Army advanced northeast on Central Belgium, while the First Canadian Army was about to sweep up the Channel coast.

The 30th Corps was the spearhead of the British drive to the north. Amiens was reached on August 31, Brussels was entered on September 3, and the city of Antwerp on the following day. This advance imposed a considerable strain on administration. We were maintaining our spearhead some 400 miles from the temporary base in Normandy. The greatest strain was thrown on road transport, because only short stretches of railway were available owing to the widespread demolitions. But all difficulties were overcome, and the pace of the pursuit was maintained.

Decision to Seize a Bridgehead

The speed of our advance through the Pas-de-Calais and into Belgium convinced me that if the Allies could concentrate and maintain sufficient strength for the task, one powerful and full-blooded thrust deep into Germany would overwhelm the enemy and carry with it decisive results. The best axis along which such a thrust could have been developed was the route north of the Ruhr leading to the plains of Northern Germany. It was obvious that the enemy would concentrate strong forces to defend this vital axis, and the industrial area of the Ruhr.

Speed was essential. The stroke could be effective only if carried out at once, taking advantage of the disorganized state of the enemy; moreover, weather conditions would inevitably deteriorate from mid-September onward and handicap the use of our air power and our airborne forces. But we would have to be strong enough on the selected axis to get decisive results quickly.

Could sufficient troops be made available, and could our maintenance resources sustain them on such long lines of communication? If so, the end of the was in sight.

The Supreme Commander came to the decision that we should not at this stage stick out our neck in one single thrust deep into enemy territory, owing to our lack of major deepwater ports. The lines of communication still stretched to the Normandy beaches and Cherbourg peninsula, and the Autumn weather was close upon us. He therefore decided that the early opening up of deepwater ports and the improvement of our maintenance facilities were prerequisites to the final assault on Germany proper. He directed that our immediate aim should be the establishment of bridges over the Rhine throughout its entire length, and that we should not go beyond this until Antwerp or Rotterdam could be opened. In view of the time factor it was agreed that the 21st Army Group should launch its thrust to the Rhine before completing the clearance of the Scheldt estuary.

I ordered the resumption of the Second Army advance from the Antwerp-Brussels area for September 6, and by September 11 a bridgehead was established over the Meuse-Escaut Canal. It was already noticeable that the enemy was beginning to recover his balance, so that the urgency of launching the thrust to the Rhine was underlined.

On Sunday, September 17, the Battle of Arnhem began. The purpose was to cross the Meuse and the Rhine and place the Second Army in a suitable position for the subsequent development of operations toward the northern face of the Ruhr and the North German plains. The thrust to Arnhem outflanked the northern extension of the West Wall, and came very near to complete success.

The essential feature of the plan was the laying of a carpet of airborne troops across the waterways from the Meuse-Escaut Canal to the Neder Rijn, on the general axis of the road through Eindhoven to Uden, Grave, Nijmegen and Arnhem. The airborne carpet and bridgehead forces were provided by two American and one British airborne divisions and a Polish parachute brigade. Along the corridor, or airborne carpet, the 30th British Corps was to advance and establish itself north of the Neder Rijn with bridgeheads over the Ijssel facing east. From the start, however, adverse weather conditions prevailed, and indeed, during the 8 vital days of the battle, there were only two on which the weather permitted even a reasonable scale of offensive air support and air transportation. As a result, the airborne formations were not completed to strength (indeed, the 82nd Airborne Division was without a complete glider-borne combat team). It had moreover been the intention to fly in the 52nd Division, but this project had to be abandoned. Re-supply missions were repeatedly cancelled, and when flown were often on a greatly reduced scale. Had reasonable weather conditions obtained, I believe that the Arnhem bridgehead would have been established and maintained.

Full success at Arnhem was denied us for two reasons. First, the weather prevented the building up of adequate forces in the vital area. Second, the enemy managed to effect a very rapid concentration of forces to oppose us, and particularly against the bridgehead over the Neder Rijn. In face of this resistance the British group of armies in the north was not strong enough to retrieve the situation created by the weather by intensifying the speed of operations on the ground. We had not the divisions to widen the corridor sufficiently quickly to reinforce Arnhem by road.

On September 25 I ordered withdrawal of the gallant Arnhem bridgehead. We retained the vital crossings at Grave and Nijmegen, and their importance was to be amply demonstrated.

On the central sector of the Allied front, by the middle of September, the First and Third U. S. Armies were fighting on the Siegfried Line from the Aachen area through the Ardennes to the region of Trier and southward along the general line of the upper Moselle. By the third week in September the Sixth U. S. Army Group which had landed at Marseilles was firmly deployed on the right of the Twelfth U. S. Army Group and the Allied front was continuous to Switzerland.

We had moved eastward toward the Rhine on a broad front, but had been halted. We had gained great successes, but had been nowhere strong enough to gain decisive results quickly.

OPERATIONS TO OPEN UP ANTWERP

The enemy had achieved a measure of recovery. This was clear not only in the Arnhem operation, but also in his reaction to American thrusts in the Siegfried Line. We had to prepare for a hard killing match before we could secure the Ruhr and advance into Germany. We had also to open the approaches to Antwerp before winter set in. The immediate intention therefore became the clearance of the Scheldt estuary.

This task was given to the First Canadian Army and lasted through October to the first week in November. The enemy resistance was vigorous, and some very hard fighting took place, leading up to the final operation for the capture of Walcheren. The reduction of this fortress presented many novel problems. These were overcome principally by very remarkable precision bombing by Bomber Command, which breached the dykes and submerged large areas of the island. The extensive use of special amphibious devices enabled our troops to operate in the resulting floods. The naval craft put up a very fine performance in this battle in spite of severe casualties from the coast defenses and the rough seas.

PREPARATIONS FOR ENTERING THE RHINELAND

As the Antwerp operations were progressing, I was busy considering regrouping for the next major battle which would precede the capture of the Ruhr. I had hoped to launch an offensive some time in the late autumn to clear the area between the Meuse and the Rhine, but it was necessary first to clean up the considerable enemy forces which remained west of the Meuse, particularly in the Venlo area. We were not strong enough to do this and at the same time undertake a major thrust between the rivers.

This phase I call "the preparations for the battle of the Rhineland"—I refer here, and throughout, to that part of the Rhineland falling in the 21st Army Group zone. These operations enabled us to economize forces by basing the front on the Meuse obstacle, and insured a friendly western flank for the battle to follow. The weather was often appalling, and the fighting took place in difficult country against a very tenacious enemy. But by early December the Second British Army was lined up along the River Meuse as far south as Maeseyck, whence the front crossed the river to the area Geilenkirchen and joined the Ninth U. S. Army.

To facilitate the Second Army operations, I transferred the responsibility for the Nijmegen bridgehead to the Canadian Army on completion of the Scheldt operations. The regrouping had a further object; the First Canadian Army was required to plan the battle of the Rhineland which was to be launched from the Nijmegen area; the Second British Army was to plan the subsequent assault across the Rhine.

While these plans were maturing, the enemy, too, was busy. The severe attrition he had exeperienced during the past two months had not prevented the reequipment of his strategic reserve. The Sixth S.S. Panzer Army was ready for battle.

Plans for regrouping of the 21st Army Group for the battle of the Rhineland were completed by early December. We had reached the stage when some divisions were actually on the move to their new concentration areas when, on December 16, the German counteroffensive in the Ardennes broke. Our plans were postponed.

THE BATTLE OF THE ARDENNES

The full weight of the German counteroffensive in the Ardennes was not immediately apparent. Extremely bad weather had precluded satisfactory air reconnaissance, and the German concentration had been carried out with a high degree of secrecy. However, on the 18th I was considering the possible effects of a major enemy thrust toward Brussels and Antwerp on our dispositions—for the Army Group was at that time transferring the bulk of its weight to the extreme northern flank. I ordered the concentration for the Rhineland battle to stop, and had plans prepared for switching some divisions from the Geilenkirchen sector to the west of the Meuse.

By the 19th the full implications of the German attack were established. It was known that the Sixth S.S. Panzer Army was thrusting in a northwestern direction towards Liége, with the Fifth Panzer Army in a wider wheel on its left. The Seventh German Army was in support. On the same day the Supreme Commander entrusted to me temporary command of the First and Ninth U. S. Armies (with effect from the 20th), as they were at that time on the northern side of the German salient and therefore remote from the Twelfth U. S. Army Group axis.

On the 19th I ordered General Dempsey to move the 30th Corps west of the Meuse to a general line from Liége to Louvan, with patrols forward along the western back of the river between Liége itself and Dinant. This Corps was thus suitably placed to prevent the enemy crossing the river, and could cover the routes from the southeast leading into Brussels. It subsequently became necessary in connection with the regrouping of the American First Army to send some British divisions east of the Meuse. But throughout the battle I was anxious to avoid committing British forces more than was necessary. Had they become involved in large numbers, an acute administrative problem would have resulted from their lines of communication crossing the axis of the two American armies. Moreover, it was foremost in my mind that as soon as we had defeated the German attack we should return to the business of the Rhineland battle as quickly as possible.

The Battle of the Ardennes was won primarily by the staunch fighting qualities of the American soldier, and the enemy's subsequent confusion was completed by the intense air action which became possible as weather conditions improved. The Sixth S.S. Panzer Army broke itself against the northern shoulder of the salient while the Fifth Panzer Army spent its drive in the fierce battles which centered on Bastogne. Regrouping of the First and Ninth U. S. Armies, assisted by British formations, made possible the rapid formation of a reserve corps of 4 U. S. divisions under General Collins. The action of this corps, coördinated with the drive from the south by General Patton's Third U. S. Army, pinched the enemy forces out of the salient and began the bitter struggle which was to push them out of the Siegfried Line.

The enemy had been prevented from crossing the Meuse in the nick of time. A detailed study of the battle would show how rapid regrouping enabled the Allies to regain the initiative which the enemy had temporarily seized. Once we were sure of the Meuse crossings it became increasingly apparent that the opportunity had come to turn the enemy's position to our advantage. Hitler's projected counteroffensive ended in a tactical defeat, and the Germans received a tremendous battering. As soon as the situation had been restored I was able to order the British divisions north again to the concentration areas which had been made ready in December.

THE BATTLE OF THE RHINELAND

The main objective of the Allies on the Western Front remained the Ruhr. Once the Ruhr had been isolated from the rest of Germany, the enemy's capacity to continue the struggle would quickly peter out. Beyond this, the object of our operations was to force mobile war on the enemy by developing operations into the northern plains of Germany. We were therefore required to line up on the Rhine; then to bridge the river and gain a suitable jumping off position for a mobile campaign in the spring. The enemy was in a very bad way; he had suffered another major defeat with heavy losses in men and equipment. Moreover, the great

Russian winter offensive was now under way, and we did not wish to give the enemy the chance to switch forces to the east.

The Supreme Commander's orders to the 21st Army Group provided for a line-up on the Rhine from Düsseldorf northward. The Ninth U. S. Army remained under my operational control.

First we had to eliminate the enemy salient west of the River Roer between Julich and Roermond. The Second Army completed this task by January 28. The divisions concerned, less defensive troops left holding the river line, immediately started north to join the concentration for the Rhineland battle. In studying the plan for this battle you should notice how the grouping of the armies was related to their subsequent tasks. I have already mentioned the transfer of the Nijmegen bridgehead to the First Canadian Army, which was to be responsible for the northern thrust.

The Battle of the Rhineland was based on two converging offensives between the Rhine and the Meuse with the object of destroying the enemy forces masking the Ruhr. It was intended, by interdiction from the air and by employing the maximum available forces on the ground, to prevent the enemy withdrawing to the east bank of the Rhine. In this we were largely successful.

The First Canadian Army was ordered to launch an attack southeast from the area of the Nijmegen bridgehead to meet the Ninth U. S. Army, whose thrust was developed from the Julich-Roermond sector northward. It was originally planned to launch the two operations almost simultaneously, but the southern thrust was delayed. In the event this proved to our advantage.

The date by which the Ninth U. S. Army could attack was dependent on the rate at which U. S. divisions could be released from other sectors of the Allied front, as the strength of that Army was to be increased to 12 divisions. Release of these divisions depended on the situation on the rest of the front. The Twelfth U. S. Army Group was still involved in the Ardennes, particularly in thrusting toward the system of dams on the River Roer which control its flood waters. As long as the enemy held these dams he was in a position to impose flood conditions likely to impede the crossing of the river. Farther south, the heaviest fighting was in the Saar and in the Colmar pocket—in both areas the enemy had achieved local successes. The weather remained an anxious uncertainty. The thaw was beginning and, apart from the floods, it was playing havoc with our road communications.

The concentration of divisions for the Canadian Army attack was completed in the first week of February. Elaborate arrangements were made to assemble the forces employed into the very confined concentration areas, and also to mislead the enemy about our intentions.

On February 8 the northern wing of the pincer movement started. The 30th Corps, under command of the First Canadian Army, launched its attack into the Reichswald Forest and the northern extension of the West Wall on a front of 5 divisions, supported by very considerable air forces and over 1,000 guns. This began the memorable battle which, in intensity and fierceness, equalled any which our troops have experienced in this war. The Germans quickly built up to about 11 equivalent divisions, including 4 parachute divisions and two armored divisions. In particular their paratroops fought magnificently.

Meanwhile the situation was improving in other parts of the Allied front. Operations in the Colmar area had been successfully concluded and the Germans thrown back across the Rhine at the southern extremity of the Allied front; the Saar sector had been stabilized. More important still, the Sixth S.S. Panzer Army was transferred to the eastern front to oppose the mounting Russian offensive. The concentration of American divisions into the Ninth U. S. Army was achieved remarkably quickly, over long distances, using shocking roads and tracks, and in appalling weather.

The launching of the American thrust had been planned to start between February 10 and 15 but at the last minute, before abandoning the Roer dams, the enemy carried out demolitions which loosed the flood waters. There followed an anxious period of waiting, with all the troops teed up for the battle, while the water subsided sufficiently to enable the crossing to be launched. On February 23 the Ninth U. S. Army, under command of General Simpson, commenced its attack north toward the area where the First Canadian Army was fighting a most intense battle. Owing to the delay in starting the southern thrust, the Reichswald battle had drawn enemy strength from the Ninth U. S. Army sector. The Americans took every advantage of this opportunity and advanced with admirable speed; their action in its turn eased the pressure in the north.

As the Ninth U. S. Army swung north, the First U. S. Army was made responsible by the Supreme Commander for the security of its southern flank; the thrusts toward Cologne were thus related directly to our operations.

The keynotes of the Battle of the Rhineland were the intense and fanatical opposition of the enemy who, as we had hoped, accepted battle west of the Rhine, and secondly the appalling weather conditions. The northern flank of the Reichswald operations was conducted mainly in various types of amphibious vehicles; in general, the mud and slush were indescribable and greatly hampered the movement of troops and supplies through the heavily wooded areas which are so lacking in roads.

On March 3 the two armies linked up, but it was not until the 10th that the enemy bridgehead covering Wesel was liquidated. The 21st Army Group was now lined up on the Rhine as far south as Düsseldorf.

The enemy had suffered yet another heavy defeat. He had lost nearly 100,000 men in killed, wounded and prisoners. Eighteen divisions and a large number of hastily formed units had been battered. The end of the war could now only be a matter of weeks. Once more the essential factor was speed.

Meanwhile, on March 7-8, farther to the south, the First U. S. Army had secured the bridge intact at Remagen after a quick advance through most difficult country, and Cologne had been captured. By the middle of the month the Third U. S. Army completed a remarkable operation, which brought it up to the Rhine at Coblenz and thence along the line of the Moselle to Kyllburg. The Sixth U. S. Army Group was forcing its way into the Saar from the south.

Outstanding German Mistakes

This is a good moment to pause and consider the German situation at the time the 21st Army Group was preparing to cross the Rhine. To my mind, from the time the Germans became involved in war with Russia and America in 1941, the fate of Germany was sealed. From then on the question was how long it would take the Allies to win.

Between Normandy and the Rhine the Germans made three major errors which were to lose them the war in Europe by May, 1945. The first was the decision to fight the Battle of France south of the Seine. By failing to surrender the territory between the Seine and the Loire and to take advantage of the Seine obstacle, they suffered those tremendous losses which I have already mentioned, and in addition there were obvious and widespread political repercussions. But they subsequently made a most remarkable recovery. They succeeded in forming and equipping new divisions, and they established a cohesive front on the rivers and canals of the Low Countries. They proceeded to build up a strong mobile striking force, which by December was ready for action.

Then came the second mistake. They launched a counteroffensive in the Ardennes designed to hit the Allies so hard that the German striking force could subsequently be switched to the east. But they failed to win the air battle first; they had not the air resources nor adequate supplies of fuel for a major counter stroke, and were wrong to attempt it. While some progress was made in the short period of bad weather, the enterprise was doomed to failure. A counterattack, Yes; a counteroffensive, No.

Following the failure in the Ardennes, the proper procedure was to withdraw behind the Rhine. The third big mistake was the decision to stand and fight west of the river in the hope of masking the Ruhr.

After the crippling losses sustained in the Battle of the Rhineland, the end of the war was only a matter of weeks. The Germans had not the manpower to raise new divisions, and in any case their industry could not have equipped fresh formations. The policy of dispersing German industry rebounded now that they were unable to assemble war material or move it to the fighting troops. Their remaining oil refineries and storage plants were being subjected to increasingly heavy air attacks, and their communications were rapidly being reduced to a state of chaos. As a result they had not the transport or fuel necessary for mobile operations, nor had they the tanks to compete with the Allied armored forces in battle.

The Battle of the Rhine

The quicker we could engage the enemy in mobile warfare in the north German plains, the sooner the end would come. While the Battle of the Rhineland was proceeding, the details for the crossing of the Rhine were being worked out. Many engineering and administrative preparations had been initiated back in December, before the Ardennes counteroffensive. In particular, work had started on the roads and railways necessary to establish our lines of communication across the Meuse and Rhine. We had furthermore stocked the Second Army depots with some 130,000 tons of stores for the coming operations. And so the 21st Army Group launched the operation for crossing the Rhine a fortnight after completion of the Battle of the Rhineland. Future history must give the armies great credit for this. It was a most remarkable achievement.

The fortnight between the end of the Battle of the Rhineland and the crossing of the Rhine was one of intense activity. Formations were regrouped and lined up in their correct positions, covered by a screen of troops holding the riverbank. Dense and continuous clouds of smoke were employed to hide our intentions and final preparations.

The attack began on the night of March 23, and by the next morning all 4 assaulting divisions (two British and two American) and the British commando brigade had accomplished their initial crossings between Rheinburg and Rees. The key to the crossing was the important communication center of Wesel, which was captured by the commando brigade after an intense air attack by Bomber Command. On the morning of the 24th, the XVIII U. S. Airborne Corps, with one British and one American airborne division, dropped on the east bank of the Rhine within supporting distance of our guns on the west bank.

The enemy reaction was initially strongest on the northern flank, where three parachute divisions had been concentrated. But generally speaking his power of maneuver was greatly limited by the very heavy air interdiction program which had been originated several days before the assault. The airborne troops took full advantage of his failure to launch any effective counterattack against them and rapidly made contact with the formations crossing the river. The British and American bridgeheads were quickly joined. Some remarkable engineering feats were accomplished in working ferries and bridging the river, and it is interesting to note that the Royal Navy was well to the fore with craft which had been dragged by road all across Belgium, southern Holland and the Rhineland.

We were now in a position to drive into the plains of northern Germany. It was a matter of great satisfaction to see how plans which had been maturing back on the Seine were reaching their fulfilment.

Meanwhile, the Remagen bridgehead continued to engage increasing enemy forces, and in spite of them was steadily expanded. The bridgehead was extended to Bonn and the First U. S. Army began thrusting east and northeast in a drive which had reached the Paderborn area by the end of the month. The Third U. S. Army had crossed the Moselle and, in conjunction with the Sixth U. S. Army Group, eliminated the Saar triangle and brought the whole Allied front up to the Rhine. In the fourth week of March General Patton's forces crossed the river astride Mainz and came up on the right of the Frist U. S. Army.

THE ADVANCE TO THE ELBE AND BALTIC

Within 4 days our bridgehead over the Rhine had been established, and on March 28 the advance to the Elbe began. On the right flank the Ninth U. S. Army was directed to the sector Magdeburg-Wittenberge. In the center the Second Army was to advance with its left flank on Hamburg. On the left, the 2nd Canadian Corps, after crossing through the Second Army bridgehead, swung north along the Rhine to outflank Arnhem and open up the routes leading northward from that area. Later, the 1st Canadian Corps assaulted across the river at Arnhem and turned into western Holland to establish a protective flank between the Rhine and the Zuider Zee.

The enemy tried desperately to assemble his remaining forces in opposition to our advance. The core of his resistance formed on the Ems-Dortmund Canal, facing the left and center of the Second Army. Bitter fighting ensued. In the meantime, in the Ninth U. S. Army sector and on the right of the Second Army progress was rapid. By April 3, the Ninth U. S. Army had reached the Weser in the Minden area and had linked up with the First U. S. Army advancing from the Remagen bridgehead. The Ruhr was enveloped. The Ninth U. S. Army reverted to the command of the Twelfth U. S. Army Group. The two U. S. armies proceeded with the clearance of the Ruhr and at the same time pushed forces eastward to the Elbe.

The subsequent action of the 21st Army Group may be compared with the drive across northwest France. The German east-west lines of communication to the coast were progressively cut, and a series of right hooks were delivered to round up the enemy. The left flank formations drove up toward the coast to finish him off.

The 8th Corps of the Second Army crossed the Weser near Minden on April 5, followed a few days later farther north by the 12th Corps, which then worked its way along the east bank in an advance that brought it to the outskirts of Hamburg. This wide turning movement loosened the enemy on the left, and while Bremen was masked from the south by the 30th Corps, a hook farther up river came in on the city from the east. Bremen fell at the end of the month.

The First Canadian Army made steady progress, and by mid-April had liberated most of northern Holland. By the same time the 1st Canadian Corps had safeguarded our flank in western Holland and isolated the large enemy garrison there.

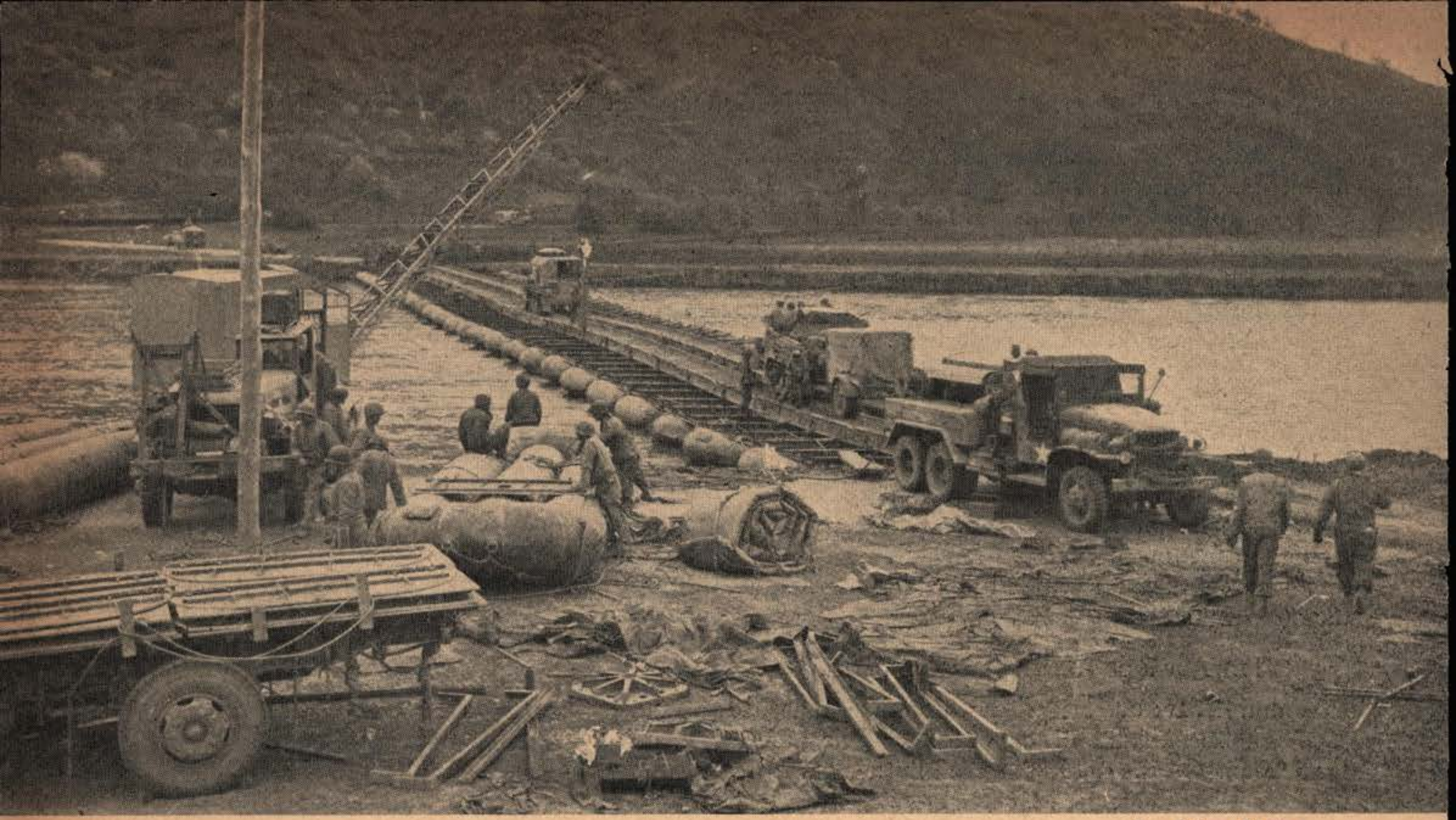
The main drive to the Elbe continued toward Luneburg, which was reached on the 18th, and our forces began to line up on the southern bank of the river masking the city of Hamburg. The Elbe was crossed on April 20 and spearheads made straight for Lubeck in order to seal off the Schleswig-Holstein peninsula. At the same time, moving by road, a U. S. airborne corps of two divisions, together with the 6th British Airborne Division, formed a defensive flank facing east on the line Darchau-Schwerin-Wismar. Once across the river our operations were virtually unopposed. The plan for outflanking Hamburg by a maneuver similar to that used at Bremen was actually under way when, on May 2, the Germans came out to negotiate its surrender. Across the Elbe the countryside was packed with a mass of German soldiers and refugees fleeing from our own advance and from that of the Russians, with whom we established contact on May 2.

The negotiations which began in Hamburg led on May 3 to the dispatch by Doenitz of envoys to my tactical headquarters, then at Luneburg Heath. By this time I had ordered a pause in our advance to be made on a line which would cover Hamburg and Lubeck. Some fighting was still in progress with German remnants in the Cuxhaven and Emden peninsulas.

The German delegation which came to my headquarters was headed by General-Admiral von Friedeburg, Commander in Chief of the German Navy. He was accompanied by General Kinzel, Chief of Staff to Field Marshal Busch, and by Vice-Admiral Wagner. I quickly established that they had not in fact come to negotiate the unconditional surrender of the troops on my front, and at once made it clear that I would not discuss any other matters. I did, however, take the opportunity to show Von Friedburg the operational situation on my map; and when he realized, apparently for the first time, the plight of the German armies on the various fronts, he broke down and wept. He hurried off to recommend to Doenitz the unconditional surrender of all German naval, land and air forces opposite the 21st Army Group. On the evening of May 4th, Von Friedeburg returned to my headquarters and signed the instrument of unconditional surrender of those forces.

Cease fire was ordered on the 21st Army Group front as from 8 A.M. on May 5.

(In the concluding installment in the next issue of THE CAVALRY JOURNAL, Field Marshal Montgomery discusses: The Grouping of Forces; Specialized Equipment; The Royal Armored Corps; Artillery; The Engineers; Signals; Infantry; Airborne Forces; The Medical Organization; and Conclusions.)



Signal Corps Photo

Half-tracks of the 3d Armored Division cross the Saale River in Germany on bridge constructed by the 23d Engineers.

The Armored Engineers

WHENEVER we glanced at a press account of a characteristic sortie of an armored division in the campaign in Europe, we were often overwhelmed by the correspondent's stock of vigorous verbs and appropriate adjectives. The blank armored division "slashed," "ripped," "plunged through," "stormed through," "overran," "annihilated" and, in general, raised so much hell, that, in the minds of most readers was conjured the vision of an unstoppable juggernaut that needed only to be placed in motion and it would not stop until its commander willed it. Such was not always the case, in spite of all of the artistic verisimilitudes of war reporting, and many a tank commander read those accounts with his tongue in his cheek, especially if his attack had been halted by a cleverly laid minefield, an ingenious road block, a demolished bridge, or one of a dozen other means that the not always withdrawing foe employed.

Confronted by these obstacles the tank officer was certain to shout for his armored engineers, who were, if the tanker was battle-wise, within earshot at the head of the column, and the elimination of such obstacles was quickly undertaken.

Let's then take a look at these armored engineers in the armored divisions, the counterpart of the combat engineers in the infantry division; and, the wherewithal at their disposal with which they performed the multitude of jobs that was their lot in order to break the tanks loose through obstacles that would have stopped them.

Of about the same size as an engineer combat battalion (38 officers, 675 enlisted men) the armored engineer battalion is completely mobile with its organic transportation which includes some armored vehicles. It has three line companies and a headquarters company. With its commanding officer a member of the division commander's special staff, the battalion is completely in the tactical picture at all times as to what is happening and the part it will play.

Containing modern engineer equipment with the emphasis upon machinery rather than manpower to obtain results, this battalion's armored bulldozers, air-compressors, flame throwers, mine detectors, gasoline-powered saws, and other apparatus in the capable hands of the armored engineers is one reason for the superlatives concerning the tank units from the newspapermen. It wasn't very long until the combat commander learned the value of the engineer bulldozer. The bulldozer with its highly trained operator could perform miracles in the way of clearing road blocks, improvising by-passes and fords, and it was little wonder that the sharpshooting crews of 88's sometimes gave a bulldozer target priority over a tank. The demolition expert was frequently in demand to eliminate by explosives an obstacle in the path of the advance, and also to create by craters, and the like, barriers on the flanks of the forward surging armored column. Flame throwers played their part both as offensive and defensive weapons, and, at the onset it was the engineer's portable thrower that did the job later taken on by flame-throwing tanks. As for mine detector crews, not only were the armored engineers masters at this dangerous game, they taught all the troops of the divisions how to operate the marvelous apparatus that was to save lives and equipment in battle. Laying protective minefields or lifting enemy ones became second nature to the engineer. Only in a stabilized situation did the armored engineers clear complete enemy minefields, normally they merely gapped the field sufficiently to get the tanks through and left the remainder, properly marked, for the army engineers to lift.

Early days in the evolution of the armored division saw a larger engineer battalion which included two additional companies: one, a line company, and the other a treadway bridge company. The bridge company was organized and equipped to transport the bridging equipment of the division.

From the time it was first conceived by the Armored Force, the treadway bridge passed through an extreme development period. Initially in a table of equipment drawn up in the fall of 1940, Captain Bruce C. Clarke (now Brigadier General) the acting Armored Force Engineer, included a bridge of treadway design unsupported for short spans and trestle supported for long ones. The length of this bridge was roughly 300 feet and no attempt at adapting it to a floating type bridge was undertaken until 1941 when the late Colonel T. H. Stanley and his assistant, Major W. E. Cowley, energetically and successfully accomplished that conversion with the development of rubber pontoons. At first known as the M1 floating treadway bridge, later superseded by the M2 floating treadway bridge, it was tested exhaustively under field conditions by armored divisions in prewar maneuvers. Results of these tests and advancements in tank and vehicle development with regard to weight and dimensions led to a corresponding trend in the M2 bridge development, with the result that a shorter and wider tread was used. Specially designed trucks were manufactured to transport and handle the basic load of 872 feet of M2 equipage with which each engineer treadway bridge company is now provided. Here again the emphasis was on machinery instead of men to do the backbreaking work with each truck being provided with a hoisting mechanism for use in unloading the bridge parts and in constructing the bridge.

The treadway bridge is the armored engineer's baby. He swears by it, he hoards it, he almost reveres it. Let someone attempt to argue the merits of other types of portable bridges and he will quickly point out that in the ETO, almost without exception the tactical bridge first open to traffic was the treadway bridge. Constructed under every condition that modern warfare created, this modern equipment utilizing a minimum of construction personnel trained to handle the bridge parts with mobile engineer cranes constantly had German high commanders baffled with the rapidity with which supposedly impassable barriers were overcome. This was not only true in the case of large streams but also in the bridging of small gaps created by demolished bridges, culverts, or road cratering.

A cleverly sited, though small, crater in a tank defile will certainly stop an armored column. Supporting Brigadier General Bruce C. Clarke's 4th Armored Combat Command (the "spearpoint of the spearhead" of Patton's sweeping drive in France) for two and one-half months, the battle-wise and sweating engineers of Company C, 24th Armored Engineer Battalion, constructed no less than 21 bridges, the average length less than 50 feet! No wonder then that Lt. Col. L. E. "Bud" Roth, in an operational report wrote—"It soon became apparent that short unsupported span treadway sections were our most important bridge, and were a tactical success due to the rapidity with which antitank obstacles could be crossed." German top-ranking officers subscribed eloquently and at great length to this fact, when, after capture they confessed their complete surprise and consternation at the speed of the engineer elimination of obstacles which permitted impatient American tanks to repeatedly nip and slice off the tail ends of retreating German columns. It is not surprising that this marvelous piece of bridging equipage is rated by many top Allied commanders as one of the principal items of tactical equipment contributing to our final victory.

To Major General Lunsford E. Oliver, now on Army Ground Forces Staff, goes much of the credit for the development of the treadway bridge. As Armored Force Engineer, in the early stages of the expansion of the Armored Force, he, realizing the urgent need for a military bridge capable of being transported by the armored engineers in the fast moving, highly mobile armored division, successfully pushed to completion the adoption of the now famous bridge. Years later, in late March 1945, as his 5th Armored Division was crossing the Rhine River at Wesel, Germany, it was using the treadway bridge in the development of which he had played so important a part. Standing on the bridge in midstream as his tanks roared by, the General urged them on at greater speed growling to the engineer officer at his side ". . . The bridge can handle them faster than this, dammit, I know!"

Although the treadway bridge company was taken out of the Armored Engineer Battalion under a reorganization and made a separate unit under Corps or Army control, experiences in the ETO proved it was necessary to make such a company available to an armored division if the complete effectiveness of the division was to be realized. An outstanding example is offered by the 5th Armored Division. On the eve of September 5, the division reached the banks of the Meuse in the vicinity of Sedan to find all the bridges destroyed. With the attached bridge company (the 993d) the divisional engineers immediately began the construction of three treadway bridges across the 200-foot stream. Erected under enemy fire the bridges were rapidly completed and allowed the division to press onward through Luxembourg and into Germany without losing momentum. No doubt due to the extended position of the division with respect to corps troops, a delay of several days might have occurred in this particular situation had it been necessary to await Corps Engineer Troops and equipment. Small wonder then that the armored divisions are insistent that the bridge company be included as a part of the division.

On the morning of March 24, 1945, the 30th Infantry Division had just gotten its assault troops across the Rhine River a few miles upstream of Wesel when Captain McAdams' engineer treadway bridge company of the 17th Armored Engineer Battalion ("Hell on wheels" 2d Armored Division) went into action. For days his men had been keyed at high pitch for the mission that every engineer dreamed of—bridging the Rhine! Planning was complete, each man knew his job and executed it well. Seven and one-half hours after commencing the bridge, it was complete. Extending 1,250 feet across this tremendous water barrier it allowed the corps commander to cross his tanks and commit them in support of the 30th's doughboys hours ahead of even the most optimistic plans. This rapid crossing, buildup, and exploitation so surprised and confused the Germans that they were completely demoralized. It helped win for the treadway company the Presidential Unit Citation which President Truman awarded when he visited Berlin.

Almost without exception, it was the same story throughout the campaign in Europe with the engineers surpassing in speed all estimated times of completion of the many tactical bridges they constructed.

Engineers, to a man, love to build bridges. Many of their apparently less glamorous missions are none the less important. Consider for a moment the typical entries in an armored engineer battalion daily log:

* * *

> "29 Aug 44—2d Platoon, Company C, cleared mine and roadblock obstacle. Knocked out 20mm gun emplacement and several enemy—no prisoners. Platoon mission to create diversionary action."

* * *

> "11 Sept 44—2d Platoon, Company B, constructed 168 feet of floating M2 treadway prior to daylight of 12 September. Remaining engineers committed as infantry during night—securing, outposting, and mopping-up bridgehead. Battalion CO severely injured in action and evacuated."

* * *

> "20 Sept 44—1st Platoon, Company A — Armored Engineer Battalion, and C Company — Armored Infantry attacked and entered Château Salins; engineers clearing 200 yds of abatis, roadblocks and mines, opening route to northeast for Task Force."

* * *

> "24 Sept 44—Plans made to continue attack to northeast—. Severe enemy counterattack was preceded morning of 24 Sept 44 by heavy artillery concentration in Company B area. Commanding Officer and Executive Officer, Company B, KIA. At 1400, 24 Sept 44 CCB considered situation untenable and ordered engineers—to withdraw through Foret de Gremercy."

* * *

> "26-27 Dec 44—2d Platoon, Company C, with advance guard CCR, supported advance of Task Force by removing mines ahead of tanks, reconnoitering possible routes and outposting sector of Task Force area upon arrival in Bastogne. Minefield removed."

* * *

Basic training of engineer soldiers includes that of infantry missions and the Armored Engineers, who proudly display the castle of their branch, had ample opportunity to put it into effect. Captain Don Hatch, veteran soldier and commander of an armored engineer company holding Hill 318 southeast of Arracourt, was ready to turn in his castles for a pair of crossed rifles on the morn of 29 September when in the early autumn dawn the Krauts attacked and overran both his 1st and 3d Platoons. Massing tanks and infantry the hill was in German hands by 0730. Hastily reorganized and bolstered by a platoon of Tank Destroyers, the engineers attacked and retook Hill 318 by midafternoon. Hand placed explosive charges accounted for 4 Panther Tanks, the TD's added an even half dozen more.

For his reconnaissance, the Armored Division Engineer depended on his engineer reconnaissance sections which were always a part of the advance guard in the tank columns. Dependent almost entirely upon radio communications, difficulties were at first experienced due to the limited range of the sections' radios. This means of communication was corrected and improved as time went on; to prevent unnecessary delay it was imperative that the engineer have adequate facilities to obtain vital information on blown bridges, minefields, impassable routes, etc., on which to base his engineer plans. Then, just as a tactical commander, he could mass his personnel and equipment in order to efficiently and expeditiously carry to completion any assigned mission. Engineer reconnaissance sections operating without armored vehicles were particularly vulnerable and often the tank units would make armored vehicles available to the engineers. In a similar way, arrangements were made to utilize division artillery and liaison planes for flying engineer missions. Armored Engineers want armored vehicles and planes organically and if the expectations of armored division commanders are to be realized we expect they'll get their planes and tanks.

Editorial Comment

General George S. Patton, Jr.

The strife is o'er
  The battle done;
The victory of life is won
  The song of triumph has begun.

Lord! by the stripes which wounded Thee,
  From death's dread sting
Thy servants free
  That we may live and sing to Thee.

THE United States Army has lost one of its most brilliant and courageous generals. On December 21, 1945 in a Seventh Army Hospital in Heidelberg, Germany, General George S. Patton, Jr. passed away after being injured in an automobile accident.

George Patton was a born soldier and a great student of military history and tactics.

From the time he graduated in 1909 from West Point, his career in the army was vigorous and colorful. After graduation he entered the cavalry and served at Cavalry posts all over the United States. He was with General Pershing on the punitive expedition into Mexico in 1916, and went to France on Pershing's staff in 1919.

In November of that year he was detailed to the Tank Corps and after a course of study at the French Tank School, joined the British when they first employed tanks at Cambrai. He later established an American Tank School at Langres, France, but he wanted action, and as commander of the 304th Tank Brigade, fought in the St. Mihiel and Meuse-Argonne offensives, when he was wounded.

In 1940 he was in command of the 3d Cavalry at Fort Myer, Virginia, but was promoted to a brigadier general and placed in command of the 2d Armored Division in 1941. A short time later he took command of the I Armored Corps.

On November 8, 1942 he landed in French Morocco and led the II Corps in the North African campaign. He was put in command of all American Forces in Tunisia and in July, 1943, went ashore at Gela, Sicily with his Seventh Army. In 38 days he had outblitzed the Blitz Kriegers. He then left the Seventh Army to organize the Third Army which he commanded in its spectacular drive across France and Germany.

The Germans had the greatest respect for his fighting abilities. It has been stated by one high German general that General Patton was feared by the German generals more than any other commander.

In December, 1944, the German Ardennes offensive had broken through Allied lines in Belgium, but although it had been checked there was a chance that the lines might not hold unless the Germans could be dealt a strong counter-blow. General Patton's Third Army moved up fast from the south (where the original Allied attack had been planned) and struck a blow on the German flank which sent it reeling back toward the Fatherland. A stunning and final blow from which it never fully recovered.

It is said that General Patton used his armored divisions as Stuart employed the Confederate cavalry.

Robert S. Allen, a United Features Syndicate writer, in an article on General Patton, stated that he considered Patton the greatest tank commander of World War II. Mr. Allen went on to say:

"In grasp of the true concept of the employment of armor and in the successful employment of large armored forces on many decisive battlefields, Patton was without peer in any army, friendly or hostile.

"Yet his first and undying love was the horse. From earliest youth to his untimely death he was the born cavalryman, in the mighty mold of Ney, Jeb Stuart, Sheridan and Forrest. He loved, understood and rode horses as only the born cavalryman can. A large part of his life, and considerable means were devoted to this passion. Also, to steeping himself in the fundamentals of cavalry tactics.

"He knew by memory the details of every consequential cavalry action and campaign from ancient times down. He fought his tanks as the cavalry chieftains of history fought their battles on horses. To Patton the tank was a mechanical modern version of the horse, an implement to wage lightning-fast and paralyzing war.

"With the tank he coupled the airplane. To him it, too, was merely another version of cavalry.

"Until the day of gas-powered mechanical warfare, cavalry had performed the role of executing wide end runs, of breaking through an enemy's lines, of enveloping his rear and destroying his lines of communication and supply. Patton employed the tank-plane team to the same ends.

"That was the core of his genius as a great battle commander and the secret of his fabulous victories.

"But horses were his great love. Time and again, in Africa, Sicily and the ETO, he vainly beseeched higher authority to give him some horse cavalry on the ground that he could employ it with decisive effect to implement his tank-plane team. He greatly admired the Russian cavalry and followed intently the exploits of the Cossacks on the Eastern Front."

In a recent letter to Major General John K. Herr, U.S.A. retired, former Chief of Cavalry, General Patton wrote:

"At the Secretary of War's press conference, I stated that had we possessed Cavalry in Tunisia or Sicily, very few Germans would have escaped. I personally advocate the retention of at least one cavalry division (horse) and the creation of a number of cavalry regiments (mechanized)."

Fate was cruel to this brilliant military leader who continually defied death on the battlefields of Northern Africa, Sicily, France, and Germany, and then, when he was due to return home for a long well-earned leave, was fatally injured in an automobile.

General Patton was buried at Hamm, Luxembourg in the area where he did such brilliant fighting, where his achievements will never be forgotten, and where rest the bodies of hundreds of other courageous American soldiers who fought there with him.

It is the way George Patton would want it to be.

* * *

Autoflight Jet Propulsion Unit

A REVOLUTIONARY American version of the German V-1 buzz bomb engine, so efficient it can fly through the air without wings, is one of the latest developments in the field of jet propulsion. Today suitable only for supersonic speed airplanes, tomorrow scientists may apply it to all types of marine and land transportation.

Information released by the Army on a small test model of 2-lb. thrust, which is but four one-thousandths of the size of the V-1 engine in capacity, states that it works perfectly in every respect and, pound for pound, is superior in many other ways to the German propulsion unit. The tiny wind tunnel model is but two feet long and approximately two inches in diameter, is made of aluminum alloy and stainless steel and weighs only five ounces. With a small, lightweight fuel tank, this engine, launched from an inclined plane, would fly through the air without the necessity of wings.

The engine is fully controllable, burns gasoline or kerosene, and, after once being started by means of a small spark plug, will run until fuel is exhausted without ignition being necessary. The engineers who developed it claim considerably greater efficiency for the Klose model, known as the Autoflight jet propulsion engine, over its German prototype by reason of more thrust, less weight and smaller size. The American model also fires many times faster than the German engine, thus developing more power. The wind tunnel model, for instance, when operating at full throttle, fires several hundred explosions per second.

One of the problems yet to be solved in jet engine construction, according to the engineers, consists of sound control, since attempts to muffle jet engines have resulted in great loss of efficiency. Engineers who work in wind tunnels and testing laboratories with jet engines wear earplugs, otherwise they are subject to headaches and ringing ears for several days.

Potential use of this new jet engine is still a subject under government restriction.

COMBAT EXPERIENCES

Now is the time to write us a story of your experiences in combat.

The lessons you learned are valuable to others in the future training of our armed forces.

Even though the war is over, the record of what happened there still is important—and will be for historical reference.

We need articles on armored combat especially.

Now that you have more time, why not write up how your unit fought, what it learned, and the mistakes it made?

Write it your own way. Include photos if possible.

Anything from 500 to 2,000 words or more.

Address it to: The Cavalry Journal, 1719 K St., N.W., Washington 6, D. C.

What have you learned in combat that will help others?

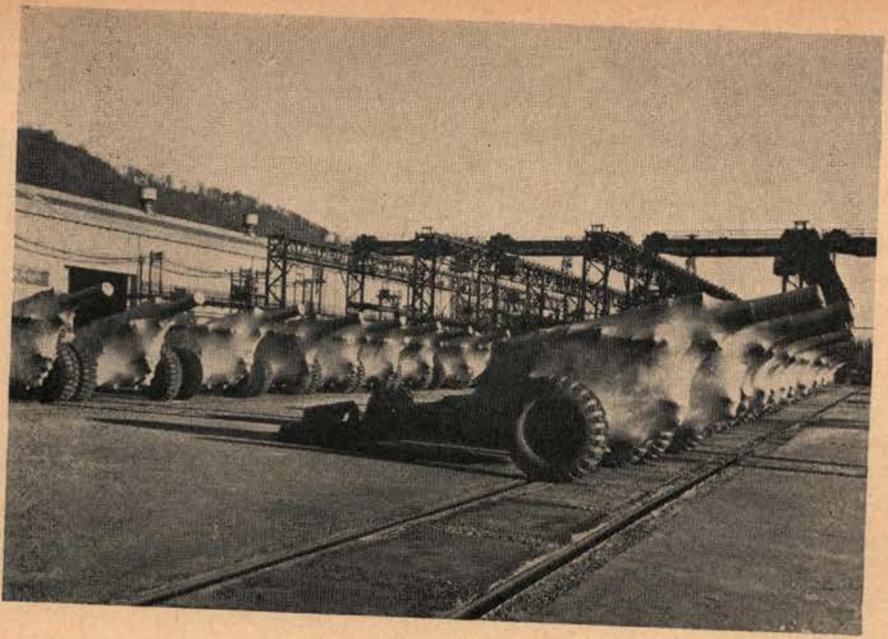


Photo No. 1. Army Ordnance matériel is shown in live storage. This method of storage, developed by the Navy and described in the November-December issue of The Cavalry Journal, is good only for interim storage. The methods described in the story below will preserve matériel for from 25 to 50 years.

LONG TERM STORAGE

by Colonel Fred J. Gilbert, Ordnance

UPON the termination of the war, the Ordnance Department was faced with the gigantic task of preserving and storing quantities of war reserve fighting matériel. With the coöperation of industry and scientific institutions, a new departure from any method previously used to store equipment has been developed. This new method, which has very little if any parallel in industry, might be described as the "canning" of Ordnance equipment.

"Canning" actually means placing various types of fighting equipment in sealed metal containers in order to eliminate the destructive forces of nature in the form of rust, corrosion, mildew, etc., which render our fighting equipment useless when permitted to gain any degree of headway.

Attention to this postwar problem is being given at this time because it is vital that the taxpayers' investment in war equipment be conserved to the greatest possible extent. In line with the philosophy of our forefathers of "keeping our powder dry," it is felt that the majority of this ultra-modern fighting equipment should be placed in permanent storage where it can be kept with little or no attention until it might be needed, or until it becomes obsolete.

By enclosing equipment in sealed containers, maintenance costs can be eliminated. Rather than fritter away energy and funds in recurring maintenance, Ordnance engineers will now be in a position to concentrate on research and development of improved weapons to keep American fighting equipment in the forefront in world preparedness.

The conventional approach to this problem has been through disassembly of complicated equipment and coating with Cosmoline. Due to the complexity of the newer equipment, it would hardly be possible to reassemble under emergency conditions and meet a deadline.

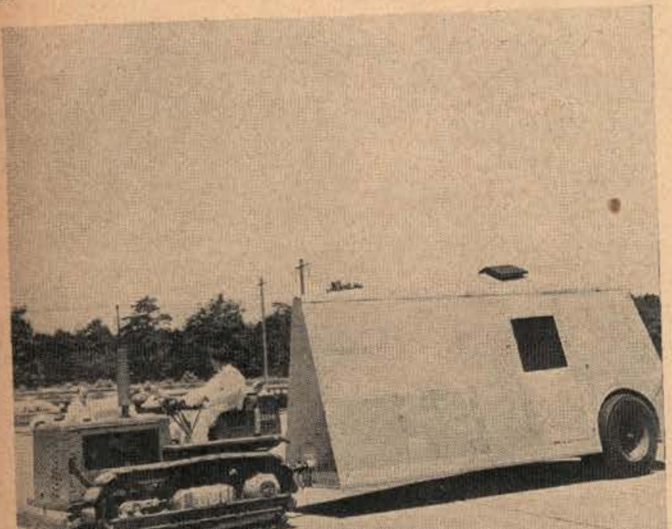
Common experience looks upon ordinary warehousing as a satisfactory method of storage. Ordnance Department experience definitely proves that in many cases inside warehousing permits serious corrosion. The astronomical production of the present war has increased the requirement for storage space to the extent that if warehouses were to be used, the space now available to Ordnance would have to be increased many, many times, and still would not provide adequate protection.

Any maintenance of complicated matériel in Ordnance warehouses necessitates a continuous schedule of overhaul and relubrication. For example, an antiaircraft gun, which must be overhauled every 12 to 18 months to keep it in operating condition, costs from $1,000 to $5,000 per gun per overhaul.

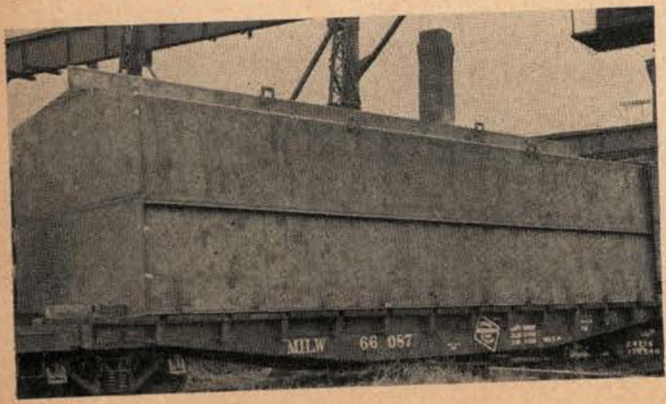
Dehumidified warehouses have been suggested as a method of eliminating the maintenance burden—but only specially constructed warehouses can be dehumidified and these would be extremely expensive to build and operate.

It is important to emphasize that ordinary so-called "air-conditioned" buildings are inadequate, since it is necessary to maintain a relative humidity level below 30 per cent at all times to insure absence of corrosion, whereas many air-conditioned buildings operate at a relative humidity of from 50 to 70 per cent.

The average person realizes that rust or corrosion of simple metal objects exposed to the out-of-doors is less serious in certain dry localities in the far west. Investigation in coöperation with the weather bureau has established that no part of the United States consistently has a relative humidity at the safe level (below 30 per cent). In fact, in Ordnance equipment where "breathing" and condensation occur, rust and corrosion have been worse in some depots in dry areas than in other parts of the country. Unfortunately also, the relatively dry areas are sparsely populated and are relatively inaccessible, increasing the difficulty of rapid redeployment during emergency, after concentration in such localities. Fortunately, "canning" permits independence of locality, since corrosion factors are eliminated, thereby permitting strategic deployment of fighting equipment according to the demands of the situation. Such localities may even include advance bases, on tropical islands, in the Arctic, or in the Canal Zone, without imposing any maintenance burdens.



Above: Photo No. 2. Aluminum "warehouse on wheels."
Below: Photo No. 3. Igloo fabricated from sheet steel.



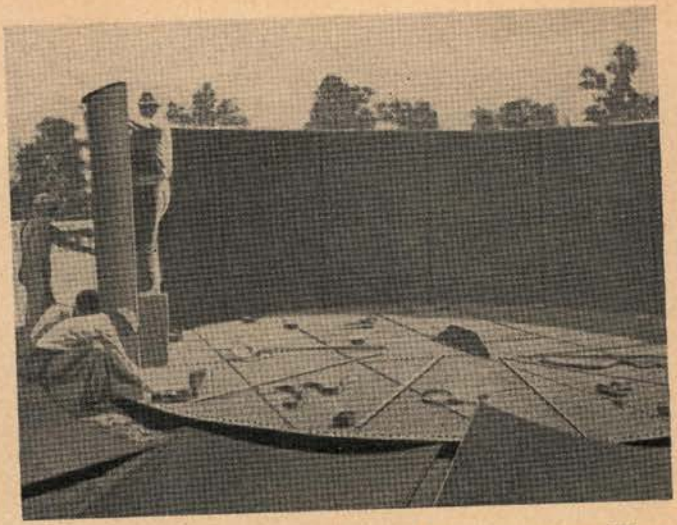


Photo No. 4. Gasoline storage tank for storing artillery.

A plastic form of protection of the sealed type has been developed, known as strippable film* to be used for storage of equipment during comparatively short periods, such as three to 5 years. This plastic hardly is adequate for indefinite long-term storage, but appears to be one of the most promising means of preserving matériel for interim storage. (See photo number 1.)

In order for rust or corrosion to occur, it is necessary that both moisture and oxygen be present. However, if the moisture content is very low (below 30 per cent relative humidity), no deterioration of metals is to be expected.

The cans are actually metal packages of the following types:

(a) Hermetically sealed steel containers filled with either dry air or nitrogen; or in some cases a dessicant such as silica gel, is placed in the container to absorb the moisture.

(b) Aluminum containers connected to the atmosphere through a breather which balances the pressure and dehumidifies all air entering the container. It will be noted in photograph number 2 that this type of container will permit the wheels to remain in place on the gun carriage outside the can during transportation, so that it is truly a dehumidified warehouse on wheels.

(c) Steel igloos fabricated from sheet steel originally intended for bomb bodies. In this type of container can be packed, for example, one 240mm howitzer on wagon, and in addition to this, 12 75mm howitzers. (See photo number 3.)

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*See "Live Storage" in the November-December, 1945, issue of The CAVALRY JOURNAL.

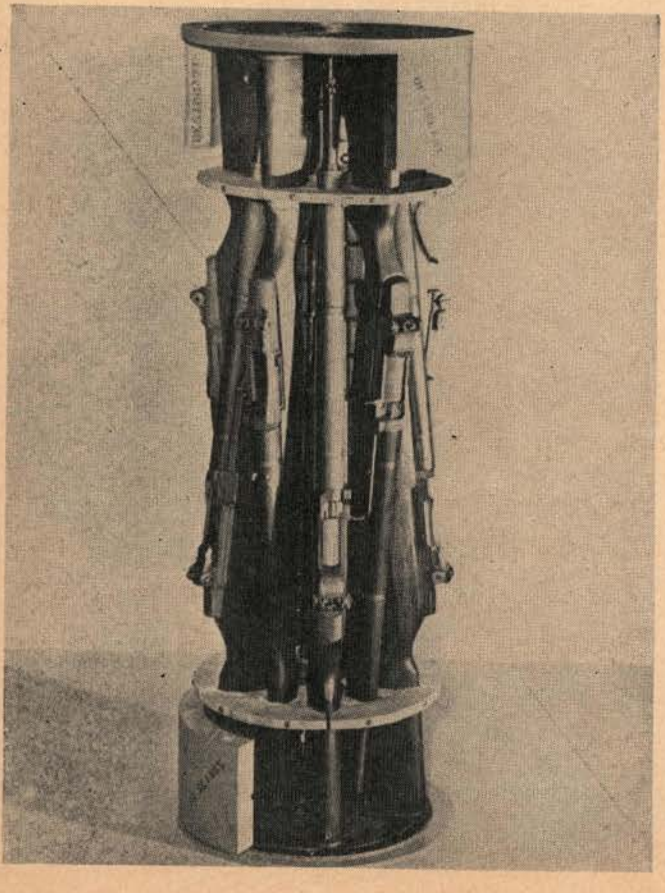
(d) Government owned gasoline storage tanks up to and including tanks of 55 feet in diameter are also contemplated for storing artillery and tank and automotive equipment. (See photo number 4.)

Both the igloo and gasoline storage types are either statically or dynamically dehumidified. In some cases the use of a vapor phase inhibitor is being tried.

The proposed container for packaging .30 caliber M1 rifles and M2 carbines (see photo number 5) for long-term storage is a welded steel drum 38-13/16 inches long, with a diameter of 14⅛ inches. Ten carbines are disposed symmetrically in a welded carrier assembly which is fabricated from steel stampings and pipes or tubes. The carrier assembly is provided with a handle to facilitate removal from the container after it is opened. Glass fiber material is used in several locations in the assembly for cushioning. The carbines are secured in place in the carrier assembly by stamped end pieces and steel bands.

Provision is made in the carrier for 10 slings and for sufficient dessicant material to maintain a relative humidity not in excess of 30 per cent over the range of − 56 degrees F to + 160 degrees F. The atmosphere of the container will be air. The carbines will be coated with a preservative oil, conforming to U.S.A. Spec. 2-122.

Photo No. 5. Container for storing M1 rifles.



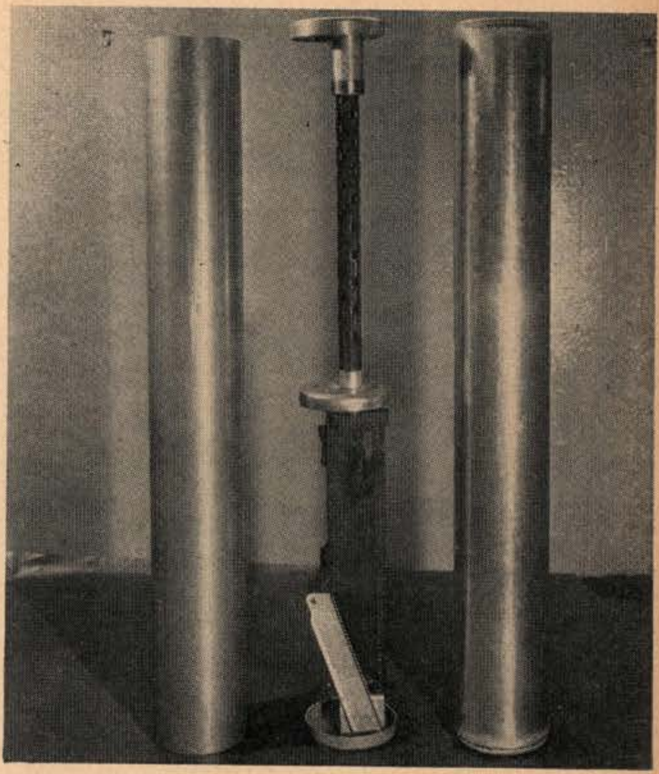


Photo No. 6. Container for storing machine gun.

It is planned that the final assembly of carbines in the container will be carried on in a room with a temperature of 70 degrees F and a relative humidity of 40 per cent. The cover of the container will be seam welded after the carbines are in place to form a hermetical seal. The slings will be treated before being enclosed in the container. Also, the carbines and magazines will be dried in an oven before being dipped in warm oil.

The gross weight of the container is approximately 106 pounds. This compares favorably with a comparable weight of 98 pounds for the regular export pack heretofore used for 10 carbines. It is estimated that the cost of packaging the carbines in the proposed container will be approximately $2.00 per carbine. The comparable cost of packaging in a conventional export pack would be approximately $1.00 per carbine. However, it is believed that superior protection afforded by the hermetically sealed container far outweighs the additional expense.

The container proposed for long-term storage of the .50 caliber M2 Browning aircraft basic machine gun, is a welded aluminum cylinder 59⅜ inches long by 7¾ inches in diameter. (See photo number 6.)

One machine gun is mounted in the container by suitable support members. Provision is made within the container for dessicant material sufficient to maintain a relative humidity not in excess of 30 per cent over the range of − 65 degrees F to + 160 degrees. The atmosphere of the container will be air. The machine gun will be coated with protective oil conforming with U.S.A. Spec. 2-122. The final assembly of the machine

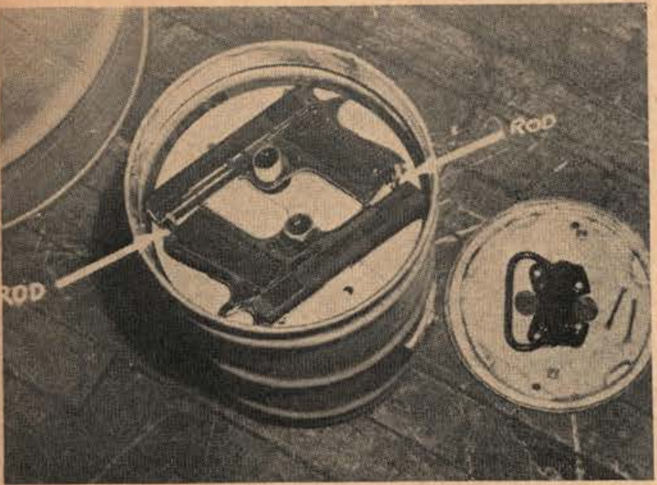


Photo No. 7. Packaging method for .45 caliber pistols.

gun in the container will also be carried out in a room with conditions as outlined for the carbines.

The cover of the container will be seam welded after the machine gun is in place to form a hermetical seal. The end caps of the container are assembled with end dished inward in order to provide means for readier handling of the container. The gross weight of the loaded container is 80 pounds. The corresponding weight of the conventional export package for the .50 caliber aircraft machine gun is 104 pounds. It is to be noted that a substantial reduction in weight has been made in the use of the aluminum container. The estimated cost of "canning" machine guns in the proposed container will be approximately $14.00 per machine gun in lots of 25,000, whereas the present standard export package would cost approximately $10.00 per machine gun.

The particular method used to pack the .45 caliber pistol is shown in photographs number 7 and 8.

The superior protection afforded by the hermetically sealed container far outweighs the additional expense. The metal type of container may be stored in the open indefinitely with only nominal surveillance, whereas the conventional wooden boxes would deteriorate under average conditions in this country. In the tropics or in sub-tropics, the organic material in the conventional export boxes would be subject to attack by insects and mold; whereas the metal container with a suitable preservative would furnish adequate protection over a period of years with normal surveillance.

Strategically a number of important observations are made possible of attainment by the adoption of metal containers. First and foremost, the adoption of the container will make it possible to remove reserves of machine guns, etc., to any point in the world to storage out-of-doors and so stored will be in a completed assembly condition ready for action immediately upon removal from the container.

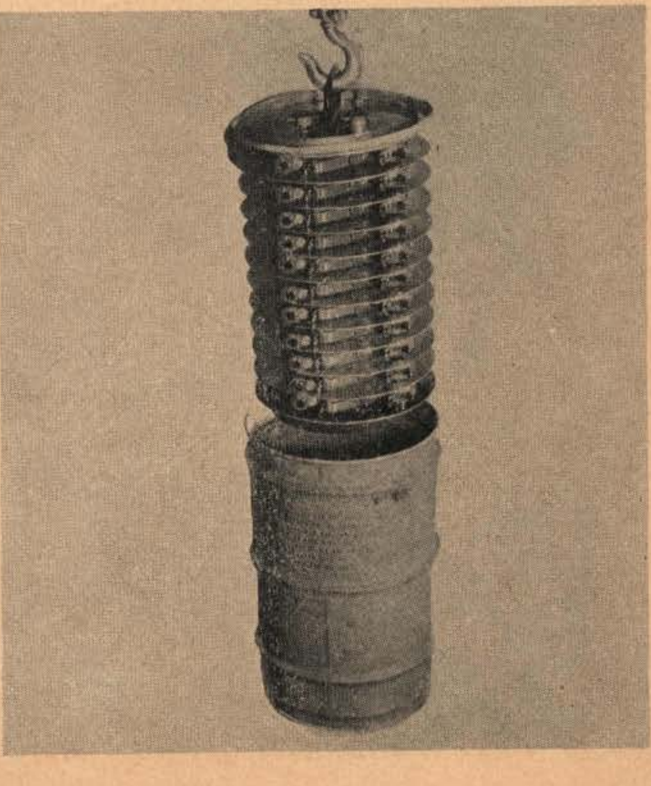
Needless to say, it will be possible to redistribute the reserves of machine guns, pistols and revolvers, so protected, at any time, in any manner designated by strategic and tactical considerations. Assembled reserve stores may be removed to a different theater or they may be widely distributed to any theater to minimize the possibility of destruction by surprise attack. Wide dispersal would not be possible in a fluid situation if the containers did not provide substantial protection during open storage with little surveillance.

The question naturally arises as to what fighting equipment will be put into the cans. Experience has taught that advances in weapons are relatively much slower than advances in transportation. Transport vehicles which follow commercial practice will not be canned. Weapons in most cases will be canned.

The costs involved in "canning" are a vital consideration. Study of the problem has proven that canning is actually the cheapest way of preserving Ordnance equipment for long periods, such as 25 to 50 years. Figures now available indicate that the cost of canning to preserve the matériel for this long period will be up to 5 per cent of the value of the matériel. This cost should be the only cost involved, as further upkeep and care are eliminated through this new process.

It should be pointed out that huge sums are invested in Ordnance items. A 90mm gun on carriage M1A1 costs about $40,000 and a 40mm gun with director costs about $17,000. If the traditional method of storage were used at a cost of $1,000 to $5,000 per overhaul, these weapons would cost more in overhaul than their value in 25 years. By canning, it is actually possible to preserve for 50 years a newly overhauled gun for less than the cost of one overhaul.

Photo No. 8. .45 caliber pistols ready for storage.



Where Is That Storm?

Spherics Can Tell Us

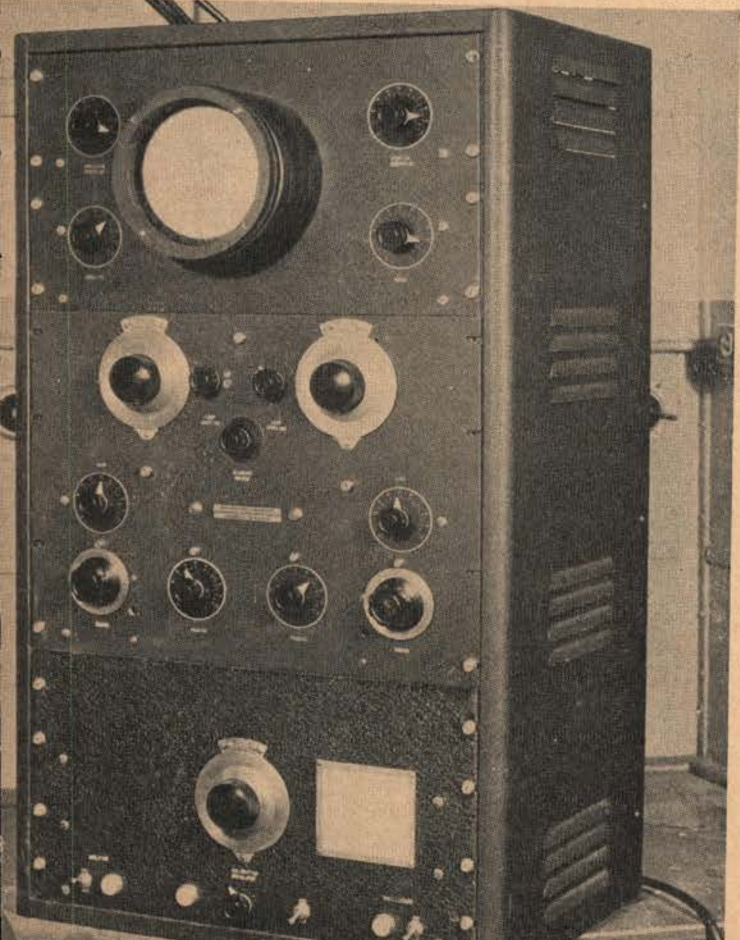
by Signal Corps for the Cavalry Journal

A NEW field of electronics now enables weather forecasters to plot the locations of distant storm centers across thousands of miles of ocean. This is accomplished through the long-range detection of static electricity in thunderstorms, cloud masses, or rainfall.

Spherics is the name for the new electronic, storm-detection technique, and of the static bursts on which it relies. Spherics is based upon the principle that most atmospheric disturbances are accompanied by spheric discharges, and that when these are detected from a distance, they may be assumed to indicate the existence of a storm. Meteorologists thus are able to plot the locations of storms over large areas without making on-the-spot observations.

Since the science of weather forecasting necessitates keeping track of the current weather over wide areas (including oceans, polar wastes, and enemy-held territory), where maintenance of weather stations is difficult or impossible, the acquisition of this data by a few conveniently located spherics stations may effect a significant increase in the accuracy of weather forecasting throughout the world.

Direction Finder and panel layout of "Storm Detector."
Signal Corps Photo

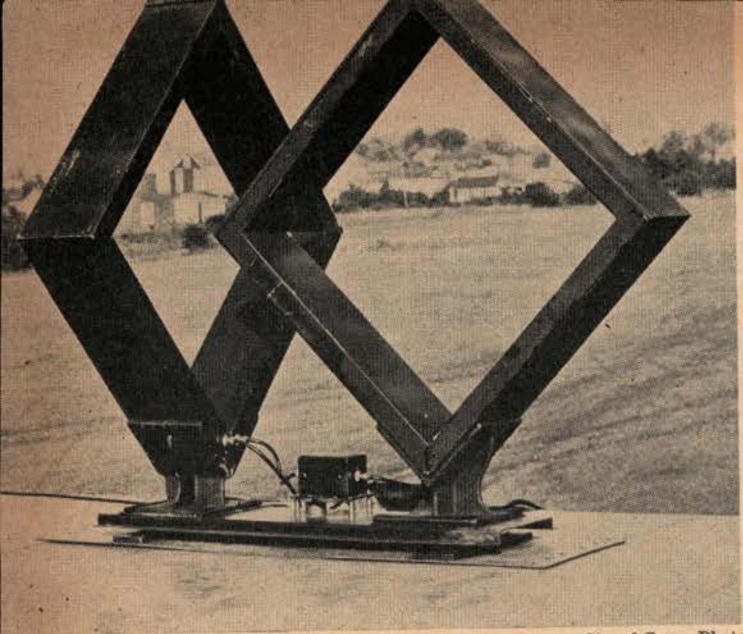


The long-range detection of spheric impulses, upon which the new technique depends, is accomplished by means of a *static direction finder,* which is comparable to the standard radio direction finder in that it uses directional antennas to determine the precise direction to the source of a received impulse. Unlike the more elementary radio direction finder equipment, the static direction finder antennas are nonrotating, and the direction to the source of a received signal is indicated by a flash on the face of an oscilloscope.

The static direction finder consists essentially of two crossed loop antennas, powerful amplifying circuits, and the oscilloscope. The spheric impulses received by the antennas are amplified and applied to the plates of the oscilloscope to create transitory flashes. The position of the flash on the face of the 'scope indicates the direction of the static source. When the direction of the static source is known in relation to two or more such receivers, the location of the atmospheric disturbance may readily be plotted on a map by means of triangulation.

At intervals since June 23, 1944, the Signal Corps has maintained an experimental spherics network covering the western portion of the North Atlantic. This service is credited with having contributed materially to the safety of air flights over the Atlantic. The three initial stations in this Atlantic Coast Network were located at the Signal Corps Engineering Laboratories near Red Bank, N. J.; the University of Florida at Gainesville, Florida; and on the island of Bermuda. A fourth station, sited near St. Johns, Newfoundland, was later added to extend the range of the net and check the accuracy of fixes made by the other stations. Communication between the several stations was maintained by mobile radio sets mounted in 2½-ton trucks. There was no "net control station" as such; the various stations alternated on reporting their observations, and the plotting was carried on at each station.

To verify the data compiled by the Atlantic Coast Network, a program of aerial reconnaissance was conducted over the North Atlantic for several months. Two



Signal Corps Photo

Loop antennas, bases, and buffer assembly of finder.

B-17 bombers fitted with weather equipment and manned by specially trained crews, made regular flights during which weather observers recorded all meteorological phenomena every 15 minutes. In the course of 50 flights, 81 per cent of all data in the flight path compiled by the network were verified by "significant weather" within 100 miles. The minimum dependable range of the individual direction finders was found to be about 2,000 miles; the range of the network, of course, was limited to the range at which three or more stations could take bearings on the same spheric.

Additional spherics networks were later established to cover the Caribbean Sea and the Western Pacific. Experience showed that (1) the spherics technique was not as effective in tropical climates as in temperate regions; (2) that nocturnal observations were less accurate than those made in the daytime; and (3) because of the comparatively low frequency of spheric impulses, deflection of the ground wave causes a considerable factor of error, especially in coastal locations. Another element of error results when the direction finders pick up low-frequency communication transmissions simultaneously with spheric impulses.

The spherics direction finders currently used by the army are based upon a design developed by physicists at the University of Florida. The basic set has been redesigned by the Signal Corps for increased ruggedness and adaptability to military use. Both sets weigh about 450 pounds. The frequency range of later sets was increased.

Most radio direction finders are designed to detect continuous wave signals which are sufficiently enduring in time to permit the determination of direction by rotation of an antenna. The two loop antennas are erected at right angles to each other in such a way that the plane of one is perpendicular to the north-south direction, and the plane of the other is perpendicular to the east-west direction. Each antenna consists of 400 turns of wire wound inside a waterproof aluminum shield.

The loop antennas are especially suitable for spherics work because of their directional characteristics and sensitivity to low frequency signals. A signal arriving from a direction parallel to the plane of a loop produces a maximum response, while a signal from a direction at right angles to the loop plane yields no response. When the loops are mounted at right angles to each other, signals arriving along the ground produce in each loop a voltage the value of which is determined by the strength and angle of approach of each received signal.

The output voltages of the two loops are amplified to the point where they are strong enough to deflect the oscilloscope electron beam, which produces a glowing spot when it strikes the fluorescent screen of the tube.

Through a process of applying voltages, the orientation of the line on the oscilloscope is made the same as the true azimuth of the atmospheric disturbance which caused the signal.

Since the provision of a high degree of selectivity in the amplifying systems of a spherics direction finder would decrease rather than increase its efficiency, interference is a major problem. Undesired signals, which cause interference, result from such man-made static sources as ignition systems, electric arcs, and motor commutators, or from low frequency communications transmitters.

In view of the brief duration of the oscilloscope flashes, a certain element of error is inherent in the instantaneous visual reading of the directional bearings. The Signal Corps is attempting to overcome this problem by developing auxiliary photographic equipment which records the oscilloscope indications on 35mm film. This equipment includes a motion-picture camera through which the film is drawn continuously at a speed of one to 5 inches per second, and a continuous action developer which automatically processes and dries the exposed film received directly from the camera. The film is then projected upon a viewing screen. The camera action is synchronized at all stations of the spherics network by a radio timing unit which produces timing pulses, accurate to within one part in 50,000. This auxiliary photographic equipment is still in the laboratory stage.

The results achieved in an exploratory observational program on interpretation of spheric records, conducted by the University of New Mexico under contract for the Signal Corps, indicate that significant improvements in spherics techniques may soon be possible. Through a study of photographic records of spheric wave forms, the New Mexico researchers found that approximately 5 per cent of the forms have simple repeated patterns, which can be analyzed. A study of the time intervals between these repeated patterns gives evidence of a ground wave and a series of sky waves which bounced back and forth between the earth and the ionosphere as many as 7 times. It is possible thus to calculate both the height of the ionosphere and the distance of the spheric source from the length of the intervals. These results point to the possibility of single-station location of thunderstorms over large areas.

Greatest Smoke Screens in History

by Lieutenant D. Wilson MacArthur*

THE immense development of air power, both for reconnaissance and for bombing attack, created an urgent need in Britain and abroad for some means of hiding vital war targets and troop movements.

Camouflage, even carried to great lengths, was not enough; the most expert camouflage can often be detected by trained eyes, and the camouflage that will defeat the normal eye is not always effective against the color-blind eye of a camera.

The answer was the smoke screen, used by navies ever since the introduction of steam. Its first obvious application was in protecting harbors and vital war factories from enemy observation and attack. For this purpose the ack-ack screen was devised.

The ordinary orchard heater furnished the basis for research into the production of smoke on a large scale, and after various modifications it emerged as the first smoke generator, producing a dark oily smoke. Next came the larger Haslar smoke generator, also oil burning, and large numbers of these were deployed at British ports and inland. By this means whole areas could be covered by an impenetrable cloud of smoke, through which it was impossible to detect the location of shipping, port installations, armaments factories or dumps. There was, of course, one serious objection. Thick clouds of sooty, oily smoke made life extremely uncomfortable for everyone in the area.

At the same time, research was going on into other types of smoke, and the "chemical pot" was developed. It consisted of a canister containing chemicals which, upon combustion, produce a thick, white smoke. It is ignited with a match and, once ignited, the combustion continues of its own accord.

Another type of chemical "smoke" generator contains fuming acid, forced out under pressure, spraying a liquid which immediately turns into a white fog. Smoke liquids could be used by aircraft for laying screens, while smoke bombs of the chemical type could be shot from mortars, the flash of the propellant igniting them. Various types of smoke floats were also devised for use from ships. Chemical smoke, however, had one great disadvantage; although not so unpleasant as dark oil smoke, it was apt to cause a cough, and men could not remain in it indefinitely. Finally, the American Esso and Besler machines were introduced. These use a special oil which is forced out into the air and immediately turns into a white fog which is very persistent and, at the same time, non-irritant.

Thus, smoke and fog were used in many different ways, ranging from the small smoke bomb, fired from a hand-carried mortar, for immediate protection by the infantryman, and the long-range smoke shell used by artillery for providing cover for advanced units or spotting the fall of shot to the full-scale screen which covered many miles, for ack-ack or tactical purposes.

Apart from the screens laid down to cover harbors and inland targets in Britain, one of the most spectacular uses of smoke was in beleaguered Malta, where the enemy could indulge almost at will in short-range daylight bombing.

On May 10, 1942, H.M.S. *Welshman* docked at Malta with a particularly valuable cargo, which included smoke apparatus. Enemy attack was expected within a very short time, and a smoke screen was immediately organized. It was manned largely by survivors of recently sunk vessels—whose reward was to be a passage home in the *Welshman,* if she survived!

The first attack came, just one hour after she had docked; but by then the screen had become effective, and the enemy dropped their bombs blind through an impenetrable barrage of smoke that hid the target completely. She was not hit. Three more attacks were made at short intervals; but the screen was maintained, and the *Welshman* remained untouched.

From this small beginning at Malta, 7 frontages were soon developed which covered between 7,000 and 8,000 yards, and eventually a coverage circuit of from 5 to 6 miles, which included the whole of the Grand Harbor, was obtained.

This great screen was fully operative by the time the August convoy fought its way to the island, and the ships had the fullest protection when they arrived.

By the summer of 1942 in the Middle East Theater large smoke screens were prepared for the protection of important ports and inland targets, particularly at Alexandria, Suez and Haifa. This method of frustrating enemy observation may have been partly responsible for the fact that no heavy attacks ever developed on these ports.

Smoke was to play a still more vital rôle in the great North African campaign, when many severe attacks, particularly at night, were launched against the harbors seized by the Allies, which included Philippeville,

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*British Royal Naval Reserve; Scottish novelist.

Bougie, Bone and Algiers, and within the next 6 months, Sousse, Sfax, Bizerta and Tunis. By November, 1942, 10 major screens were operating and smoke became a first priority. As each port was captured, the screen was prepared and was in full operation within a day or so.

This led to the provision of ack-ack screens at every port taken in the Sicilian and Italian campaigns. All the stores and personnel were ready before the assault on Sicily began, for by this time smoke had been accepted as an essential part of warfare. In the short time between the first assault, in July 1943, and the end of the year, no fewer than 8 major screens were functioning.

Important as these ack-ack screens were, smoke was to play a still greater tactical rôle in the war. In the Dieppe raid the skilful use of smoke helped the Navy put the troops ashore, and withdraw them afterwards. The ships were able to approach within 600 yards without meeting any well-directed fire because the enemy was compelled to shoot blind into a great wall of smoke. Smoke was provided not only by the Navy but also by the Royal Air Force, who used smoke bombs, and smoke screens laid at high speed by the aircraft. Under such a cover the assault craft stormed in, while the tank landing craft were able to retire into the main screen whenever the fire from the shore became too accurate. When the time came for the withdrawal, smoke screens laid by the aircraft provided a cover under which the craft took the men off the beaches. Without this aid it might well have been impossible to reëmbark so many men.

At Salerno more extensive use was made of smoke. As soon as the troops had landed, they laid out screens on all the beaches to cover the assembly points and the landing of stores.

The battle of Cassino was planned with smoke as a major tactical weapon. From Monastery Hill the enemy had perfect observation of troop movements, artillery concentrations, and all other preparations for an assault. It was essential to discount this heavy advantage, and a great smoke plan was devised. For this the British chemical pot was used, and complete cover was provided for the crossing of the River Gari. When the assault developed, a great screen entirely covered the movements of the troops along the whole of the British and Polish fronts.

It enabled the engineers to throw bridges across the Gari for armored troops, and a continuous haze was maintained over the area in which the artillery was deployed. Afterwards the German commander stated that smoke had been used on an unprecedented scale, and compelled his gunners to shoot blind.

These experiences and developments led eventually to the greatest operation of all, the invasion of northwest Europe. First, immense ack-ack cover was provided at all the points of embarkation and over concentration of troops and matériel in Britain. A similar cover was provided after the landings to protect the Mulberry harbor and other disembarkation points. Smoke was used in the same manner in the landing on the south coast of France.

The culmination of this type of warfare, however, came with the preparations for the crossing of the Rhine. The whole of the operation of assembling troops and matériel for the crossing was completely covered by a gigantic smoke screen, and when the assault was launched the screen extended over a continuous front of 68 miles—indubitably the greatest in the history of war. Between 2,000 and 2,500 men were employed in laying and maintaining this vast screen, in addition to the great transport columns which brought up the equipment and materials.

A tactical screen intended to raise a wall of fog behind which troops and artillery and tanks can be deployed, involves a vast expenditure of labor and material, costing about 4 tons of chemicals per mile of front each hour.

Thus the tactical smoke screen played its vital rôle in many battle zones, and in at least one of these it proved completely indispensable. This was in the Anzio beachhead, where, after the enemy had contained the beachhead, the whole area occupied was under direct observation and artillery fire from the ring of hills surrounding it. Without smoke, it would have been only a matter of time, and very little time, before the beachhead would have become untenable.

Immediately after the assault, however, an ack-ack screen was laid to cover the shipping in the bay, and at the same time energetic steps were taken to protect the troops and artillery. Otherwise the whole area would have been at the mercy of the German guns, which could have picked off lorries moving along the roads, blasted troop encampments, and smashed every concentration inside the beachhead. The screen which was laid down, and maintained throughout the hours of daylight, covered a wide semicircle with a radius of three miles or more, and thus prevented observation of supply dumps and troop movements inside the area.

In the Apennines a different record was set up in the maintenance of smoke screens. Here, where perfect observation would otherwise have been possible, a screen was maintained throughout the daylight hours for 4 months to protect vital supply routes and artillery deployment areas. Much of this time the chemical pot was used, but it caused a good deal of throat irritation, and men on patrols often gave themselves away to the enemy by unavoidable coughing, so the white oil fog type of generator was introduced in the later stages.

The development and employment of smoke and fog screens, far beyond anything ever achieved by the enemy, played a vital part in protecting the harbors and factories of Britain, and in prosecuting the war in the Mediterranean and northern Europe. It undoubtedly saved not only vast quantities of matériel, but the lives of many thousands of soldiers who would otherwise have been at the mercy of German guns and planes.

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A Chemical Empire Falls[★]

by Volta Torrey

NAZI Germany was a chemical empire that rose swiftly, fell suddenly. Its history has been written now by scientists. Civilian chemists and engineers of the U. S. Strategic Bombing Survey have unraveled this unprecedented empire's inside story from secret German records, interviews with German authorities, and extensive surveys of the bombed-out plants and laboratories of the Reich's oil, chemical, rubber, and explosives industries.

These industries were the basis of Hitler's power. They produced the fuel for his war planes, U-boats, tanks, and V weapons. They supplied substitutes for the hundreds of natural products which the British blockade kept him from obtaining elsewhere. By producing innumerable items, mainly from coal, air, and water, these industries enabled the Nazis to blitz and defy much richer nations.

Unlike America, Germany had very little natural petroleum. When Hitler invaded Poland in 1939, he had on hand only enough aviation gasoline to fight for about three months, and only enough automotive gasoline and nitrogen for explosives to last about two months. New fields discovered near Vienna during the war yielded more crude oil, and additional supplies and refineries were stolen from other countries. Even so, more than four-fifths of the Nazis' gasoline, 99 per cent of their rubber, and all of the nitric acid used in their explosives came from Germany's plentiful supplies of coal.

Friedrich Bergius, a Nobel Prize winner, found a way in 1920 to make liquid oil molecules by splitting the complex molecules of coal and forcing hydrogen into them. Since the hydrogen had to be used under pressures up to 10,000 pounds per square inch and at high temperatures, building the compressors used in Bergius plants was a task comparable to manufacturing naval guns. Fifteen times as much steel was required for synthetic oil plants as for ordinary refineries, and the Germans devoted as much steel to the construction of such plants between 1937 and 1944 as would have been needed to build a battle fleet four times the size of the U. S. Navy in 1940.

Another prewar development, the Fischer-Tropsch process, enabled the Germans to take molecules of carbon monoxide and hydrogen from coal and build up various oil molecules. The products obtained by this synthesis had special properties, for which many chemical uses were found. But the more complicated Bergius method was used more extensively, because it was the only one by which great quantities of aviation gasoline could be produced.

Both processes were expensive; gasoline produced synthetically costs from four to five times as much as gasoline obtained from crude oil. The coal needed to make enough gasoline to fill the wing tanks of a Flying Fortress would heat an average-sized home in New York all winter, and an average-sized German synthetic oil plant consumed more electricity than an American city of 250,000.

Regardless of the cost, the Nazis set out long before the war to make themselves independent of other nations. Powder and explosives plants, which had been trimmed down to reasonable proportions by the Treaty of Versailles, were expanded with the help of a state-owned corporation created secretly in 1932. Synthetic rubber production was increased nearly 2,000 per cent in three years. And the production of synthetic liquid fuels was encouraged by slapping a tariff of 30 cents a gallon on gasoline in 1937, and by lending money and guaranteeing prices to the chemical and coal concerns.

Germany's well-developed chemical industry, with 12,000 qualified chemists on its pay rolls in 1937, had grown up in the Ruhr, along the Rhine and in Central Germany, in or adjacent to the coal fields. The I. G. Farbenindustrie held the patent rights to the Bergius process and Ruhrchemie had the rights to the Fischer-Tropsch process. The old plants of these and other firms were expanded, and new plants were erected in the same areas. Thus, the oil, chemical, rubber, explosives, and other industries of the Reich were interlocked not only by their mutual dependence on coal but also historically, geographically, and mechanically.

The gigantic chemical empire that rose under Hitler's regime is described, in fact, as an "octopus" in the official report of the Oil Division of the Strategic Bombing Survey. Its body was the gas-generating plants, and its arms were the many plants that used those gases to produce a long list of chemical products.

This octopus continued to grow, despite many small aerial attacks, until the spring of 1944, when it became the target of an intensive, strategic bombing campaign by both the RAF and the 8th Air Force. It was well defended. Huge, reinforced concrete "dog houses," and brick blast walls shielded the vital parts of the plants; and bombardiers often were deceived by decoy plants—which had wooden platforms built to simulate the appearance of oil tanks, and fireworks that could be set off to make observers think that real plants were being bombed.

[★] Reprinted by courtesy of *Popular Science*, January 1946.

The bombs used against the synthetic oil targets in the first big strategic attacks were too small. People were killed, pipe-bridges, utility lines, and sewers were damaged, and operations were halted, but the plants recuperated quickly. The first aerial attacks, in other words, merely damaged some of the arms of the octopus. But later, as bigger bombs were developed and hurled against these targets, the gas-producing facilities which were the heart of the whole group of industries were hit and shattered.

Nazi authorities saw what was coming a year before the war ended. The Plans Division of the German Air Force reported in 1944 that "the greatest danger lies in the threat to the fuel supply," and Albert Speer, Reichminister for Armaments and War Production, confidentially warned Hitler that "if the attacks on the chemical industries continue . . . those very materials essential for continuation of modern warfare will be unavailable in the most important fields."

Edmund Geilenberg, a former miner who had worked his way up to be manager of the Brunswick Steel Works, was made General Commissioner for Immediate Measures. These measures included the swift, energetic repairing of bombed-out plants, and steps to disperse oil production facilities and move plants underground. Geilenberg was told by Hitler to tackle the work "with a generous supply of manpower and material and reckless energy."

Exactly one year after he was given almost unlimited authority, American occupation forces found Geilenberg repairing bicycles. At one time, however, he had commanded a labor force of 350,000 persons, and the speed with which his crews repaired the damaged plants made it necessary for the airmen to attack oil targets time and time again.

The most grandiose of the Nazi plans to save their chemical industries were those which called for hiding small plants in the woods throughout Germany, where they would be as invisible from the air as the stills of Kentucky moonshiners, and moving enough additional plants underground to keep the Luftwaffe in the air.

In the opinion of the Strategic Bombing Survey's experts, the idea of moving fuel production underground was feasible. Properly designed and ventilated oil plants could be operated underground with reasonable safety. But the German's underground and dispersal program was never completed. It would have required a full year's labor by at least 200,000 men, more than were employed in the whole oil-refining industry of the United States in 1944, and the Americans and Russians closed in on the Nazis too fast for them to prolong the war this way.

Even if they had succeeded in moving colossal plants underground, the destruction of railroads and sources of power on the surface would have made the plants of little value. Lack of storage space would have kept them from running at full capacity without adequate, regular, transportation service. With no more steel than was used to repair damaged surface plants, however, the Germans could have run pipelines to refineries from oil fields and extended a network of distribution pipes throughout Germany. They might then have been able to supply their armed forces with a respectable quantity of oil products despite the strategic bombing.

Instead, aviation gasoline became so scarce that the Luftwaffe had to stop training pilots in September 1944. Men with only 40 to 45 hours of flight training were sent into combat, countless planes were lost because of the pilots' inexperience, and hundreds of planes were grounded.

Automotive gasoline became so scarce that the speed limit was set at 17 miles an hour and every trip of more than 60 miles had to be approved by a commanding general. Although 1,200 German tanks were massed against the Russians at the Baranow bridgehead in 1945, the Germans had only enough fuel to refill the tanks two or three times. On other occasions, tanks and armored vehicles were moved to the front by oxen. Gas generators which made it possible to use coal or wood as fuel were put on 100,000 vehicles a year before the war ended and had even been put on 50 tanks by V.E. Day.

High explosives simultaneously became so scarce that thousands of shell cases were never filled, and rock salt comprised up to 70 per cent of the contents of others. Such shells boosted the morale of retreating German troops by making loud noises, but were only about 30 per cent as effective as properly filled shells. Nitrogen intended for use as fertilizer was diverted to munitions, but even so there was not enough. Antiaircraft ammunition became so hard to get, according to General von Axthelm of the Flak Artillery, that battery commanders were told never to fire at an enemy airplane unless, first, they were sure it was going to attack the target they were supposed to defend and, second, they felt sure they could hit it.

"In modern war," according to no less an authority than Major General Henrici, the German Army's Chief of Ordnance, "a country's ability to produce munitions decides victory or defeat. The destruction or crippling of the munitions industry is the key to victory."

The destruction of Germany's munitions industry was a by-product of the strategic attacks on synthetic oil targets. American and British air power, in fact, caused the whole German chemical empire to collapse in the last few months of the war like the One Hoss Shay.

This was before the first atomic bomb burst. How, nowadays, can any nation protect its vital war industries from air power?

Aerial and passive defenses far superior to those that Germany had would still leave American industries vulnerable, their report concludes. The best defense is the prevention of attacks.

Some Features of Modern Warfare[★]

by Major General M. Galaktionov

THIRTY years ago Germany unleased the First World War, with world domination as its aim. The rules of imperial Germany and their general staff made long and careful preparations for that war and reckoned on terminating it swiftly by defeating France, Russia and England in quick succession. However, even in the first few months a fatal defect of German strategy was revealed, namely, crass overestimation of Germany's strength and underestimation of the strength of her opponents.

The Battle of the Marne and the Russian offensive in East Prussia led to the collapse of the Germans' plans and the protraction of the war. This, in turn, led to an increasing change in relative strength in favor of the Allies and to the detriment of Germany, which began to feel all the handicaps of a war on two fronts.

Germany was vanquished in the field, but the victors failed to reap the full fruits of their decisive triumph. The "appeasement" tendencies which at one time dominated West European policy enabled the Germans to prepare for and launch a second World War.

Hitler and his clique, whose aim was to bring all human society under German domination, first turned their war machine against the countries of Western Europe and registered a number of major successes. Then Hitler Germany treacherously attacked the Soviet Union. The Red Army administered a series of defeats to the German-fascist armies which radically changed the course of the war. By the combined blows of the Red Army and the Allied Armies, Nazi Germany has been brought to the brink of disaster.

In the past 30 years, we have known two world wars, the experience of which furnishes a foundation for the modern science of warfare. But the question arises: is it right to draw general conclusions from two wars that in many respects differ so radically? In other words, how instructive are the lessons of the First World War today?

The answer to this question was furnished in the course of this war. The Nazi adventurers, while they exploited for their criminal war a number of advances in armaments—advances which, incidentally, did not originate in Germany—actually speaking, had no scientifically grounded system for conducting operations.

FAILURE OF BLITZKRIEG

The Nazis rejected positional warfare in favor of blitzkrieg. But the German armies, attacking with the aim of inflicting lightning defeat on the Soviet Union, were beaten by the Red Army. Thereupon the Hitlerites changed their line, rejected blitzkrieg and espoused positional warfare. Again the Germans were defeated by the Red Army. These fluctuations, incidentally, show that Hitler and his clique crudely misinterpreted the lessons of the war of 1914-18.

But to show where they blundered, we will deal with some of the features of the First World War.

The first distinguishing feature, which manifested itself in the very early stages of the war, when it still bore a maneuvering character, was the fire power resulting from quantitative and qualitative development of artillery and firearms of all types. Most striking of all was the use of fire power as a means of defense, largely due to the development of automatic firearms. The heavy machine gun, with its faculty for creating a solid and impenetrable zone of fire, became the chief means of defense of fortified fronts. Flanking machine-gun nests in the forests of Caillet, on the heights dominating the approaches to Fort Veau, kept the Germans besieging Verdun at bay for several months. The pillbox or concrete firepost likewise originated in Verdun. For many weeks German artillery was unable to locate and destroy these tiny points. Machine-gun fire was supplemented by artillery barrage. The attacking infantry sustained immense losses and in many cases was unable to reach the enemy's first line of trenches.

WAR ASSUMES POSITIONAL CHARACTER

The effect was to create solid and stable fronts traversing the entire theater of hostilities and behind which the infantry and artillery were ensconced. The war assumed a positional character. Both belligerent sides sought persistently for a way of breaking through into the open and passing to the tactics of movement. An attempt was also made to adapt fire power for offensive purposes, especially the faculty of artillery for demolishing defenses and opening the road for the attacking infantry. Thus arose the tactics of break-through.

Considerable experience was accumulated in the war of 1914-18 in the art of preparing for the carrying out of break-throughs. The concentration of powerful artillery forces, artillery preparation, new methods of firing and creeping barrage were all evidences of the swift development of this powerful arm.

In the First World War considerable difficulty was encountered in developing tactical success into operational success. But here, too, the beginnings of a solu-

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[★] From Krasnaya Zvezda.

tion were found, the full development of which, however, remained a matter for the future. In 1916 the first tank appeared on the battlefield, and in 1918 the Allies launched their offensives with the help of hundreds of tanks and the support of "air divisions."

German war doctrine failed to understand these features of modern warfare. It was extremely one-sided. The Germans' conception of the difference between the First and Second World Wars is very primitive. They held that the first war was exclusively one of position, but that the second was a war of maneuver in which fortified fronts play only a secondary role. They overlooked the fact that a fortified front, and hence fire power, artillery and infantry, played an outstanding part in the first war and that these features would be inherited by the second. They believed that the decisive factor of this war would be mobile formations.

The Red Army drew the correct conclusions from the experience of the First World War. Stalin's school of strategy taught that the form of maneuver that arose in the First World War would be broadly developed; hence the place of honor assigned to tanks and aircraft in our Army. On the other hand, it taught that such features of the first war as fire power, fortified fronts and the necessity of breaking through these fronts would also play a prominent part in the coming war. This explains why mobility and weight of numbers in fire power and maneuver are properly combined in the Red Army, why its artillery received such all-round development and why the fire power of the army increased generally, and why such importance is attached to the infantry. The First World War was not exclusively a war of position; it originated the modern maneuver. The Second World War is principally a war of maneuver, but maneuver combined with powerful fortified fronts. This difference in the character of the two wars was properly appreciated by the Stalin school of strategy.

Now that we can look back on five years of the Second World War, we are able more deeply and correctly to appreciate the experience of the last war. Fire power, fortified fronts and the break-through—those three principal features of the war of 1914-18—have been preserved in this war. This war further developed these features which, in fact, are characteristic of modern warfare generally.

It was already held in the First World War that the break-through, when exploited and consummated, leads to the war of maneuver. This has been corroborated in the present war, not by the Germans, however—who gained their victories at a time when the features of the present war had not yet fully manifested themselves—but by the Red Army in its grand offensive in 1942-44 when fortified fronts already existed.

The tank owed its inception to the positional warfare of 1914-18. Its armor was designed to protect troops from machine guns and its tracks for movement over battlefields crisscrossed by trenches, pitted with shell craters and covered with barbed wire entanglements. The tank became the instrument of maneuver in its new and higher form. The development of tank and mechanized troops capable of exploiting a break-through and conducting maneuvering operations in depth is a new feature of this war as compared with the last.

Another new feature is the extremely rapid and far-reaching development of aviation which, being able to cross fortified lines, attack the adversary's deep rear and strafe installations and troops on the battlefield, is radically changing the methods of warfare.

The gigantic fortified front stretching from the Barents Sea to the Gulf of Finland, from the Baltic to the Carpathians and from the Carpathians to the Black Sea is in itself convincing evidence that the fortified line which appeared in the First World War retains all its significance today. Moreover, the front of the German defenses now pierced and demolished by the Red Army was constructed in accordance with all the rules of field fortification, which have made big strides as compared with the First World War. Fire power has been increased many times over. Pillboxes and bunkers have been supplemented by antitank guns, minefields and obstacles of diverse types. Defense zones now measure scores of kilometers in depth instead of only a few kilometers as in the last war. Furthermore, strong points and fortified lines were prepared deep in the rear.

This powerful defense system was smashed by the Red Army. Of the many achievements of the Soviet science of war, special mention should be made of the supreme skill of our troops in penetrating the enemy defenses. The prime part in this is played by the artillery. A new feature compared with the last war is the combination of fire power and mobility which enables the artillery to escort attacking troops into the depths of the enemy's defenses. Another new feature is the combination of massed artillery and air attacks. Soviet infantrymen armed with tommy guns and light machine guns and escorted by tanks, guns and mortars, solve with consummate skill the most difficult problems which arise in the course of attack and exploitation in depth. Penetrating a defense zone to a depth of 10 or 15 kilometers on the first day of an offensive has become the customary rate of advance of our gallant troops.

As we have already said, the idea of exploiting a break-through in order to turn positional warfare into maneuvering warfare was already contemplated in the last war. But this was only a general idea, which failed to take account of the difficulties involved. For in order to shatter enormous enemy forces stationed along the whole front, an intricate combination of operations of diverse kinds is required which will lead to the demolition of the enemy's entire front and to the defeat of his army formations both in the front and rear. And it is precisely such a combination of successful operations governed by a single strategical plan that we observe in the Red Army's present offensive.

Let us generally and briefly enumerate these operations. They include break-through and its exploitation in depth by mobile forces simultaneously on a number of sectors; disruption of the enemy's rear communications and encirclement of his forces on the main front line and in the rear; demolition of neighboring sectors of the enemy's defenses by attacks from the front, flank and rear; successive development of operations in depth with the object of surmounting the enemy's rear defense lines and surrounding and destroying his forces.

The simultaneous development of powerful attacks along the front and in depth, drives in various directions, continuous harassing of the enemy's flanks and rear, tense fighting to overcome his fierce resistance—all demand high strategical skill on the part of the command so as to lend the mobile operations spread over vast areas a systematic and organized character.

It is impossible to recount here even the most important details of the Red Army's offensive operations in the summer of 1944. But one thing can be said, namely, that in this offensive are combined the advantages of tank and mechanized troops and aviation, adapted to the peculiarities of a war waged on wide fortified fronts and in powerful defense zones. Bold and impetuous maneuvering by mobile forces is combined with methodical and systematic demolition of the enemy's front and secure consolidation of the successes gained on lines carried far to the west.

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German Plan for Invading Britain*

DOCUMENTS discovered among the archives of the German General Staff in Berlin have revealed the enemy's plans for the invasion of Britain in the autumn of 1940. The first warning orders for this operation were issued in mid-August about a month after the fall of France.

The forces allotted for the operations numbered 23½ first line divisions, with 17 more in reserve; assuming these to be all at full strength, as they doubtless would have been, and adding the usual proportion of corps and army troops, this would represent a strength of about a third of a million men for the first line forces and a quarter of a million for the reserve—say 600,000 in all. Of the 22 first line divisions, 14 were infantry, 6 armored and two motorized; in addition, there were 1½ airborne divisions, which were to carry out a special operation of their own.

The first line force was to be divided into three armies. The 9th Army on the right, starting from bases on the Belgian and French coast, at Ostend, Dunkirk and Calais, was to land in Kent and Sussex between Margate and Hastings. In conjunction with its operations, an airborne landing was to be made north of Romney Marshes. The 16th Army in the center was to start from the stretch of French coast between Dieppe and Havre, with the British seaboard between Brighton and Portsmouth as its objective, and two airborne landings in conjunction with it were to be made on the South Downs. The 6th Army on the left was to start from the Caen-Cherbourg area and to effect a landing in the vicinity of Bournemouth and Weymouth.

The plan of operations after the securing of the beachheads was to link up the forward troops of the three armies on a general front with the north bank of the Thames estuary about Tilbury across the Gravesend, thence along the ridge of the North Downs southwest to Caterham and west to Aldershot and thence south to the coast about Portsmouth. The 9th Army was then to advance north into East Anglia as far as the Colchester area and the 16th Army into the East Midlands, pinching out London between them, while the 6th Army pushed up the estuary of the Severn. From that line mobile forces were to push further north into the Midlands toward Birmingham and the industrial areas of Lancashire and Yorkshire.

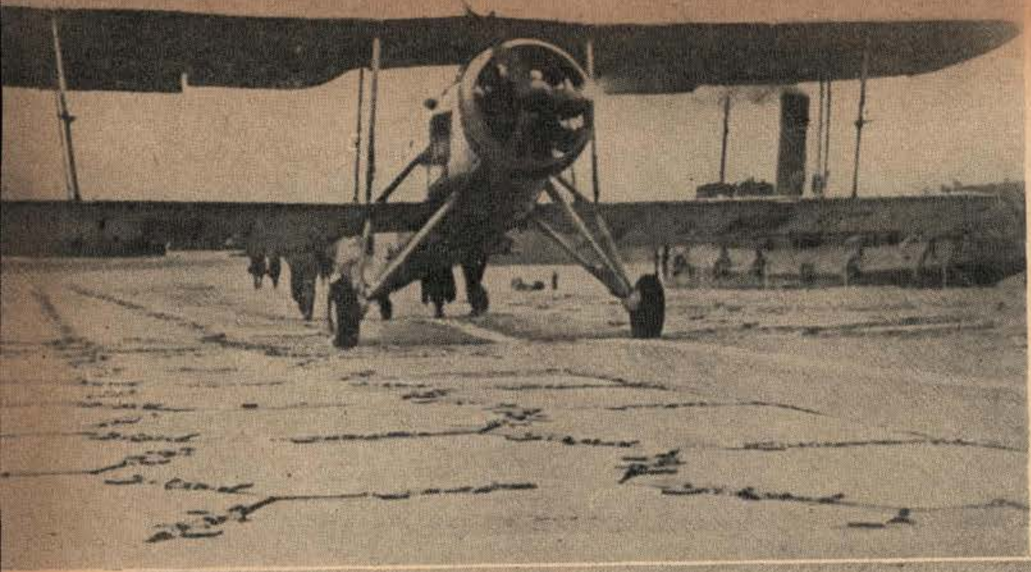
This German force allotted for the invasion of Britain was about the same strength as that used by the Allies later for the invasion of Normandy, though in the latter case the reserves were larger. On the other hand, the forces which Britain had available for defense were pitifully weak. General McNaughton, in command of the 7th Corps, had under him Britain's only completely organized and armed formations—the 1st Canadian Division, part of the 2d Canadian Division, and certain British units; there were a few regular troops and Home Guards, manning the beach coastal defenses, and that was all. The total strength of these forces was probably under, rather than over 50,000 men.

The British plan of defense was for the coastal garrisons to resist as long as possible, making use of such various secret and surprise devices as were available to inflict the maximum losses upon the enemy.

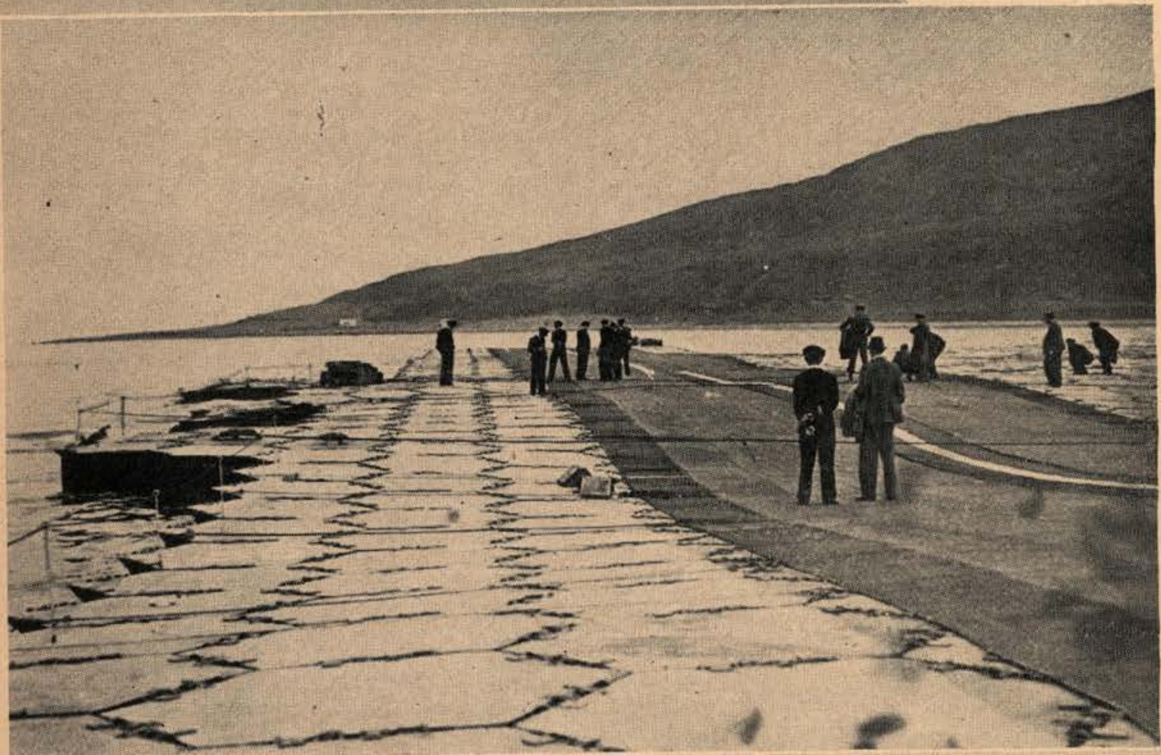
As far as could be foreseen at the time, therefore, the German invasion of 1940, had it been launched, would have been as certain of ultimate success as any operation of war could well be. Heavy losses might have been suffered, but certainly not as heavy as those subsequently incurred in the invasion of Russia in the year 1941 alone. Why the enemy never undertook it, despite the tremendous odds in his favor, of which he must have had a reasonably accurate idea, still remains a mystery. It is probable that his failure to do so was the most fateful of all the many blunders which lost him the war, for with Britain conquered and helpless, Russia could hardly have survived the subsequent attack on her, and America would have been deprived of her only possible forward base from which the reconquest of Europe could have been effected.

The Tank.

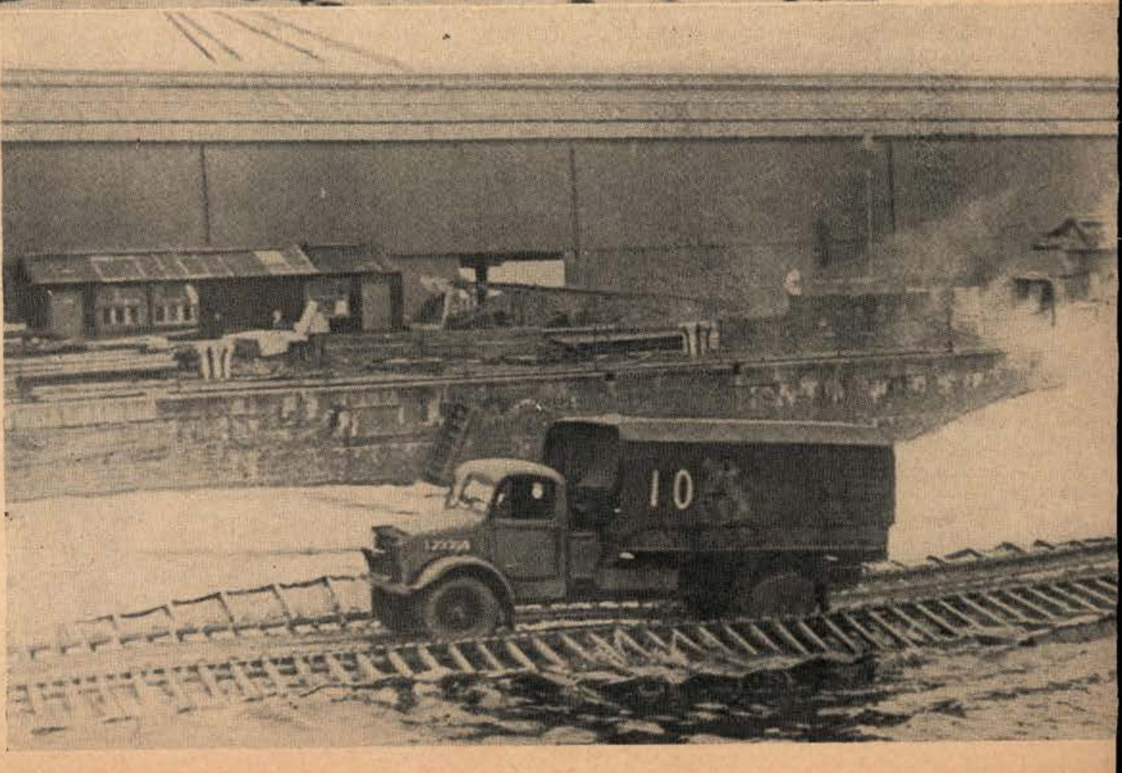
Rolling



Left: The *Swordfish* lands on the *Lily*. Note depression in surface caused by weight of the aircraft.



Above: The *Lily* undulating with the waves caused by a motor launch passing at high speed.



Right: Loaded truck moves along the Swiss Roll while large waves (trough to crest —4 feet) are produced by an M.T.B. racing alongside.

Dynamic Buoyancy[*]

BRITISH scientists have discovered a method of increasing the natural surface tension of water to make it technically possible to build a mid-Atlantic aerodrome or a floating cross-channel bridge.

Inventor of these new devices is Mr. R. M. Hamilton of London, who served at the beginning of the war as a Petty Officer in the Royal Naval Patrol Service. The new discovery has been sponsored and developed by the Royal Navy, and brings dramatic dreams within the realms of actuality.

This latest feat in engineering-on-water began when a brain wave sent the inventor motorcycling at 40 m.p.h. along a tarpaulin stretched over a river ford.

In 1941 Mr. Hamilton was turning over in his mind the general problem of floating airports when he realized the simple truth that if he could increase the natural tension of water it would support weights. He then borrowed a length of farm paling and some tarpaulin from a farmer. Bridging a local ford with them, he crossed on his motorcycle. As he crossed, he found that he was being supported on the surface of the water. He also realized that as he went at speed he made a harder surface.

Ordinary tension will support a needle on the water's surface. By putting a flexible synthetic surface on the sea, and by increasing the tension about 400,000 times, it has been found possible to support heavy lorries and aircraft in mid-ocean.

It was not until 1944 that the first practical result of this discovery was employed—the "Swiss Roll" pier, used in the Normandy invasion.

In *Swiss Roll*—a flexible canvas-and-wood jetty—a tension of 18 to 30 tons is applied to any length stretching from ship to beach and enables a laden truck to be driven ashore in safety over the sea.

Some 2,700 feet of *Swiss Roll* were in continual use at the Mulberry invasion harbor at Avranches in spite of the appalling weather conditions encountered there.

The Royal Navy's latest experiments, only recently concluded, with the *Lily* floating airstrip, have been a further development of the same fundamental principle.

Given its name because of its resemblance to a carpet of lily leaves on a pond, *Lily* is a very different proposition to *Swiss Roll*. It consists of numbers of buoyancy cans with hexagonal surfaces, so linked together that they "give" in a controlled manner to the motion of the sea from any direction, yet remain sufficiently rigid to take the weight of a heavy aircraft. These may be used to produce small islands which can be built to any shape or length required, and are easily dismantled, transported and reassembled.

Whereas in *Swiss Roll* tension is applied externally, *Lily's* hexagonal surfaces, when linked together, create their own tension. At present the cans are only 6 feet across and 30 inches deep, but their size could be scaled up to take greatly increased weight.

The Royal Navy's experimental airstrip is the smallest on which practical tests could be undertaken, 520 feet long and 60 feet across. On this an aircraft, laden to 9,000 pounds, has landed and taken off again. A strip of this size can be assembled by 40 men in one hour.

The whole surface of *Lily* is flexible so that it will not break up, but this flexibility is controlled by the use of underwater dampers. The inventor claims that, with the latest type dampers, more than three tons of pressure is required to move the surface at all, and that *Lily* will remain flat in waves up to 36 feet from crest to crest.

The dream of Atlantic aerodromes has seemed unattainable because it has not been possible to build large enough stormproof flat-surface structures. Modern transport aircraft would need a carrier or a strip twice the length of the *Queen Elizabeth*, largest ship in the world. Such a floating structure has hitherto been impractical.

The Navy's new seadrome can be transported in ships and assembled anywhere. With the present size buoyancy can, a *Lily* 2,500 feet long could be transported in three merchant ships.

Lily's possibilities for bridgebuilding are underlined by those responsible for its development.

"To mention a cross-channel bridge immediately places you with straws in your hair," said Mr. Herbert, the mathematician assisting Mr. Hamilton, "but we can say that it would be possible to build a floating bridge 22 miles long that would not break up in a sea."

The principles of *Lily* are so new that it cannot be described in usual terms, and in fact, the British Patent Office did not know in which category to place the invention. Mr. Herbert, who declared that working out the new problems in three-dimensional mathematics was "great fun," likes to refer to it as "rolling Dynamic Buoyancy" or as "a controllable, flexible surface."

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[*] British Information Services.

Official U. S. Navy Photo

Underwater demolition team daubing their bodies with a camouflage of aluminum paint before starting their dangerous swim.

Th Pioneered To T

by Commander Harold

★Condensed from *United States Nav*

THERE is seldom a job without casualties. On the Balikpapan job, no one was killed, however. Most of the injuries are from near misses by heavy shells, some of them fired by supporting ships, which must continually rake the beach only a few yards from the swimmers. . . . Strangely enough, the swimmers fear snipers less than heavy shells. They frequently see the snipers in the act of firing at them but their bobbing heads present a difficult target and few are injured. It is not extraordinary for a swimmer to receive 25 or 30 near misses from rifle fire in the two hours or less that he spends on the obstacles . . . Swimmers occasionally wear steel helmets if sniper fire is extremely heavy."

The foregoing lines are excerpts from notes forwarded to the Navy Department to aid in describing motion and still pictures taken by Combat Photographic Units of the Underwater Demolition Teams.

The notes gave many other facts essential to correct voicing of the films and the captioning of photographs. Just as matter of factly, they explained that the swimmers did most of their work *20 to 50 yards seaward of the high water mark on the beach; that the beach was narrow with considerable brush along the shore; that most of the fire was machine gun, rifle, and 37mm, although heavier shells from coastal and dual purpose guns were thrown at covering ships.*

To one familiar with the work of the Navy's Underwater Demolition Teams, the notes conveyed a comprehensive picture. To those who knew nothing of their work, as was the case with virtually all folk at home, and even with a large number of people in uniform out in the far places of the Pacific, they would give but an inkling of the story about the officers and men who went to war in blue swimming suits, measuring the depths over fire-swept reefs and beaches or pushing along ahead of them waterproofed packs of high explosives to blast a way for the landing craft.

Good reason the Navy had for not shouting to the world the accomplishments of the Underwater Demolition men. And the last to have sought publicity on their work were the men themselves.

After Tarawa, on to the end of the war, no major landing operation was attempted without reconnaissance, demolition of obstacles if such were present, or both. The Jap had sought to multiply the normal hazard of coral barrier reefs by studding them with great concrete "scullies" reinforced with sharp-pointed rails or logs, with massive log cribs filled with concrete and coral, with sharp-pointed single hardwood logs wedged down into the reefs. In many places he interwound these solid physical obstructions with barbed wire, and frequently tied in antiboat mines among them. With these underwater works the Jap's garrison commanders felt confident that they would be able to trap the waves of assaulting boats and blast them and their occupants to bits. If all of them were not stopped, the Jap commanders apparently felt certain of exacting such cost in blood that an attacker would give up.

If the Navy had not met the problem with its Underwater Demolition Teams, the Jap's reasoning might have borne fruit.

The initial major operations of the Underwater Demolition Teams in the Pacific were highly successful. The amphibious commanders perfected a fire support for these men who went swimming in against Jap defenses in broad daylight that became deadly effective.

After one good example, all the Jap needed to do was to lay traps—antipersonnel mines and other snares specifically designed to destroy the Underwater Demolition men before they could do their work. It was because the Jap failed to take these steps that the Navy kept rigid silence on demolition work. After the swimmers had finished their work and withdrawn with the ships and planes which had laid down fire support, a

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radley Say, U.S.N.R.

itute Proceedings, November, 1945.

Official U. S. Navy Photo

The web-foot attachment gives the underwater warrior extra speed and endurance in the water.

Jap garrison commander would announce that an attempted invasion had been repelled. . . . Demolition Teams right through to Okinawa and Balikpapan boated and swam to Jap beaches without meeting the traps they expected the enemy to lay for them.

This does not mean that they were unopposed. The Jap rained down shell, mortar, machine-gun and rifle fire upon them; but with doughty LCI(G)'s (landing craft loaded with 20 and 40mm guns), APD's, destroyers, cruisers, even battleships, and the air arm pouring shell and bomb upon the Jap, they were able to carry out their missions with low casualties.

The result was that assault force commanders had complete information concerning water depths on beaches of which we had no previous charts; knew where they could send their landing craft; where amtracs could successfully operate; knew that mines and obstacles were gone. All this information was in their hands from one to several days before a landing. Without this information—without this service of these men who went to the enemy's beaches in swimming trunks, tennis shoes, and one-eyed goggles and carrying little sounding lines and charges of explosives around their waists—most certainly the story of our Pacific landings would have been different.

Although there are those who have pointed out that amphibious landings were not new—the science of getting assault forces ashore against heavily defended coast or beaches was basically a new one, conceived and developed after the war was well advanced.

It was in the early part of the summer of 1943 that Cominch's planning people, conscious of the problem that lay ahead, opened the United States Navy's school for training Underwater Demolition people at Fort Pierce, Florida. Germany could be reached only by armies landing on the shores of Europe. Japan's power could be broken only by seizing the bastions she had created in the islands, minute and great, in the far reaches of the Pacific.

Commander Draper L. Kauffman, U. S. Naval Reserve, who was selected to head the school because of his experience in mine and bomb disposal, and his assistants, proceeded to guess at what the enemy would erect in the way of obstacles; then turned to devising methods of destroying them.

Thousands of Americans who served in England or passed through her ports en route to meet the German saw the improvised defenses thrown up after Dunkirk when she expected the Germans to pour across the channel. These included railroad rails driven into the sands with their outward ends sharpened, "scullies", two-ton blocks of concrete with sharpened steel rails protruding from them; miles of steel tubing or piping fashioned into scaffolding. These devices, interwoven with barbed wire, had been placed in the surf along the likely landing places on the coast.

The officers and enlisted men—all volunteers—who entered training at Fort Pierce duplicated these British defenses and conjured from their imaginations innumerable other obstacles. Then they devised ways to blow them out of the waters, theoretically covered by enemy fire. Seabees were used to build and invent obstacles. Seabee volunteers also constituted the backbone of many of the first units trained as demolition teams, and many were still at the job when the war ended. The first teams were small, units of one officer and 5 enlisted men, which grew with experience until the teams operating in the final stages of the war were composed of 13 officers and 87 enlisted men.

The training the officers and men went through at Fort Pierce, and later in the war at advanced Pacific bases, was rigorous and tough. They had to be able to swim long distances, to dive and work beneath the water; to stand exposure and remain calm under punishing gunfire. They had to learn accuracy and to memorize what they had observed. To most of them high explosives constituted a new field. They had to learn its vagaries. Life preservers of the cartridge inflation type were issued to the swimmers, who in their work in the Pacific would operate in pairs so that one might help the other were either wounded. Actually, many of them worked without preservers. In Pacific operations, they were equipped with finlike attachments for their feet which gave them greater speed and endurance in the water once they had broken in the muscles on which new strain came.

Complete surprise was so important for that morning of June 6, 1944, in Normandy that there was no opportunity for the Combat Demolition Units to reconnoiter or blast out obstacles in advance of the landings. The Navy and Army combat demolition men poured ashore with the infantry three minutes after H-hour. They landed from LCM's, two units from each. The Navy teams were composed of 8 Navy ratings and 5 Army enlisted engineers headed by an ensign or lieutenant junior grade. The Army teams consisted of 25 enlisted men led by a first or second lieutenant.

The Navy units were scheduled to clear the obstacles farthest from shore; the Army groups, those on the inshore side. The teams were to work together clearing gaps for the landing craft approaches and the paths shoreward which the debarking infantrymen would follow.

Initial landings were scheduled at extreme low tide when virtually all of the obstacles built by the Germans were exposed. It would be necessary to blow these out, even while the first wave was still pushing shoreward through them, so that subsequent waves would be unhampered.

Only those who landed that first morning can really appreciate the hurricane of fire on the beaches, particularly on Omaha, from the guns and rifles on the bluffs. Some units had their gaps—120 yards wide on the seaward end and 50 yards on the shore side—cleared in half an hour. Others were not cleared until three days later. Some teams were wiped out to a man by death or wounds. When the job was done on Omaha, casualties ran around 52 per cent.

On Utah beach where obstacles were fewer and where fire from the shore was lighter, casualties were low, and the whole job was done in a matter of 40 minutes.

Months later, when Vice Admiral Henry K. Hewitt's 8th Fleet moved in to land the Army on the south coast of France, the Underwater Demolition Teams escaped virtually without a scratch. But in this later landing, ships' guns poured fire down on the German positions while the Army and Navy teams blasted out the barricades, the mines and booby traps laid by the Germans.

A week after the landings on Normandy, while the Allied armies were still fighting desperately to widen their foothold on the continent, two of the Navy's enlarged and intensely trained Underwater Demolition Teams in broad daylight swam in to chart the reefs and lagoon depths off Saipan and to remove any obstacles the Jap might have placed there to stop invading forces. In the Marshall Island operations earlier in the year, Underwater Demolition Teams had carried out some quick reconnaissance work; but here at Saipan for the first time in the Pacific war heavy fire support had been detailed to protect the swimmers on a complete and comprehensive survey of the Jap's beaches. About 200 officers and men composed the teams assigned. A mile-long swim faced the team members from the time their boats reached the barrier reef. With two battleships and cruisers slapping shells down on the Jap's shore positions, the men swam in, measuring the water depth every 25 yards. At the close of D-minus one they were able to give accurate data on the depth of water over the area to be used; also the information that it was free from man-made obstacles. Their charts showed precisely the only paths tanks could take to reach dry land, vital information for the Marines who piled ashore next day.

After the first units had successfully landed, the Underwater Demolition Teams then blew a wide channel 6 feet deep through the reef around Saipan so that larger landing craft with guns, men, and tanks could pour ashore in volume to support the initial landing forces.

The leader of one of these teams was Commander Kauffman, organizer of the school at Fort Pierce, who had asked to be permitted to head a team in actual work. Later he was to become chief staff officer to the Commander of Underwater Demolition Teams, Pacific.

At Tinian the Underwater Demolition men along with the Marine Reconnaissance Battalion on D-minus 13 and 12 surveyed the narrow beaches which Lt. General Holland M. Smith intended to use. They did the job in black darkness without detection by the Japs. They found the surf and beach free of obstacles, and located the inland mine fields. The Marines landed on July 24 with few casualties because the Jap had not deemed it possible that anyone would dare use such narrow beaches. He expected the landings off the town of Tinian itself where the beaches were broad—and well covered by Jap gun positions.

The amphibious planners and operators were quick to apply lessons learned in the rapid tempo of the Pacific war. When the time arrived for hitting Guam, the Underwater Demolition Team work was down to a science. New methods were devised for delivering more sharply cut fire support—blistering fire coming down close ahead of the men who swam and waded ashore to discourage Jap machine gunners and riflemen from interfering with their work. Added fire from larger guns was poured on inland gun positions. For further measure, airplanes were detailed to strafe and bomb close along the shore and on island gun positions. LCI(G)'s were sent close in to the beaches to whip the sands for any targets of opportunity and to clean the trees of leaves and snipers.

In fact, the pattern as supplied at Guam was basically that used on through to the end, a continuous roll of fire rising to hurricane proportions in periods critical to the work of the Underwater Demolition men.

Official U. S. Navy Photo

An underwater demolition team swimming in to do their work. Swimmers are to the left, their buoyed explosives charges to the right.

Each time the Underwater Demolition Teams went in for a new job, they expected the Jap to have traps set for them specifically, and each time they found him waiting only with guns, mortars, and rifles. More than 3,000 obstacles they blasted from Okinawa's waters. Before the assaulting troops poured ashore on Balikpapan, a solid line of log cribs had to come out of the water.

Long before these last landings, the demolition crowd had picked up many techniques to improve their work. Recovering swimmers from the water was a highly important problem from the first. Each unnecessary second a man was left in the water as an exposed target counted against his safety. It was vital, once he had his job of the moment done, that he be got to the protection of steel-sided landing craft. Likewise, it was vital when a group of swimmers had laid their charges—designed to go up 5 minutes after the safety fuze was ignited—that they be picked up and quickly carried to safety range. This problem was solved by making rubber boats fast alongside high speed landing craft. Sighting a swimmer signaling for pick-up, the landing craft coxswain would head for him top speed. A man, selected for his strength and dexterity, would plant himself astride the outboard gunwale of the rubber boat, grab the swimmer, and plop him aboard.

A reversed technique was used in putting swimmers and their packages of tetrytol overside. The swimmer went off from one side of the rubber boat while the waterproofed explosives kept afloat by a small bladder were tossed off alongside him. He would then swim or wade to the obstacles, pushing the explosives ahead.

At low tide, many of the reefs on which the Jap had built his obstacles were entirely bare, making a swimmer a cold target for snipers or distant gunners. In such cases if sufficient fire could not be delivered to keep the enemy down, the swimmers worked when the tide was partially in to give them coverage. Underwater Demolition men found that it was hard for an enemy to hit them when he had only their heads at which to aim. Also, they found it comparatively easy to escape Jap rifle bullets when swimming simply by diving and keeping under water as much as possible. Many Underwater Demolition men have come through the war, bringing home as souvenirs bullets that were fired at them and which they caught spent under water.

The tetrytol charges were placed in groups, then tied together with primacord, itself an instantaneous explosive. When the last charge was placed, the swimmers would hastily withdraw for pick-up. The Underwater Demolition men were equipped with waterproof watches which were synchronized. At prearranged or signaled moment, the fuze, or fuzes if groups of explosives were used, would be ignited. Coral, concrete, logs, steel, and masses of ocean would fly skyward hundreds of feet.

When the job was done and the swimmers and their support craft withdrew, Tokyo's radio on numerous occasions proclaimed that the Americans had attempted another landing and been repulsed.

Next day the Marines or Army infantrymen would come piling on the Jap's beaches.

The "Royals" (1st Royal Dragoons), part of the British 1st Cavalry Division, fought successfully in Syria against Vichy French forces. Photograph on the right was taken in Palestine in 1939 and shows a troop of the Dragoons.

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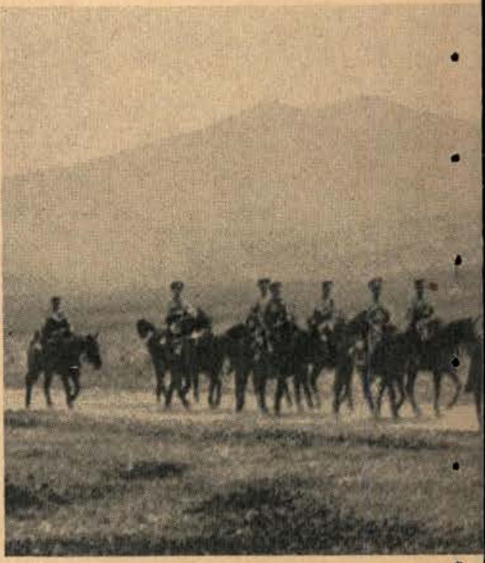
Pictures by Major

Above photograph shows the 1st Royal Dragoons on the march in Palestine, 1939-40.

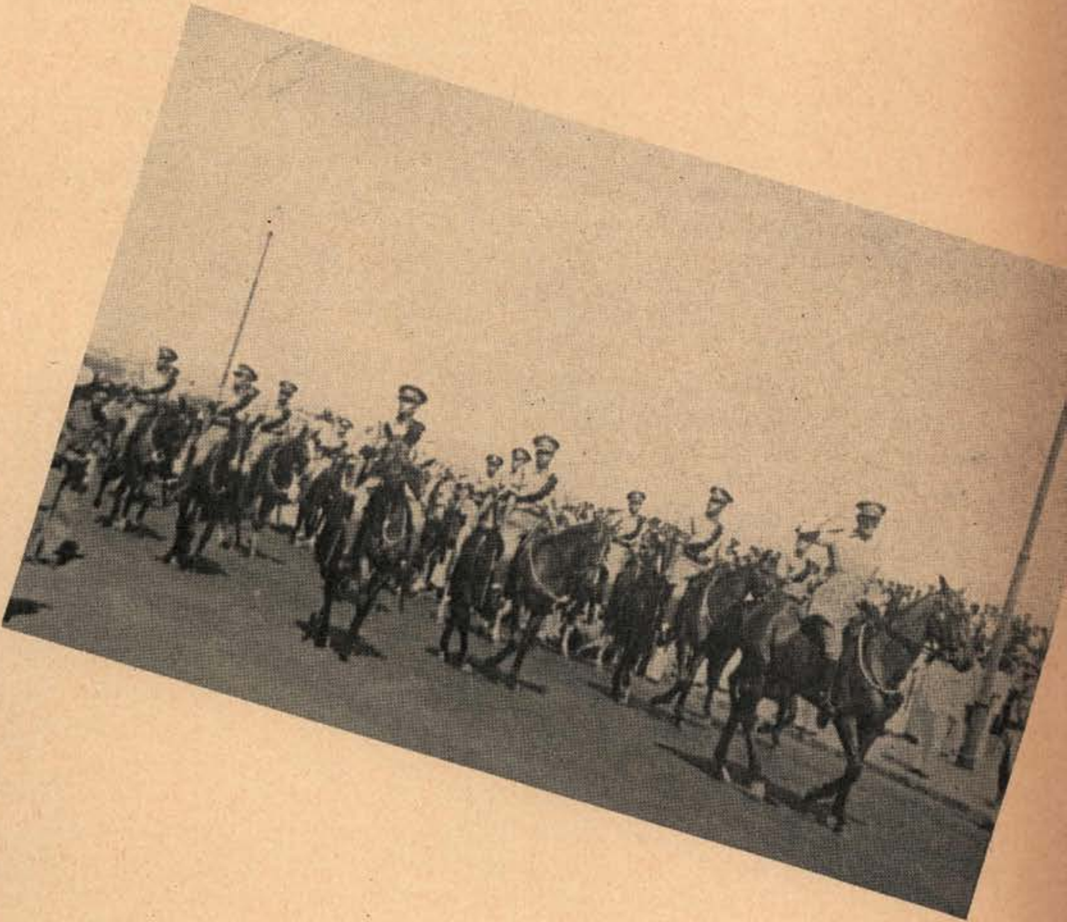


Upper Center: A sapper section of the Dragoons during the campaign against the Vichy French in 1940-41.

HORSES N WAR II

Winston W. Ehrgott

Below: A squadron of British Mounted Police in Alexandria, Egypt, 1943. This and sister mounted units kept order amongst desert Arabs. Men and officers were cavalrymen from famous regiments. They were mounted on tough little Sudanese ponies.



Left: The Dragoons after a successful action against Vichy French forces in Syria, 1940-41. Despite inadequate arms they defeated French armored cars disastrously.

Who Beats Phantom?

by Major John North*

The "Phantom" patrols of the British G.H.Q. Liaison Regiment were the "eyes and ears" of the British Army throughout the European War. In every fighting zone they sought information about the enemy. At the request of General Eisenhower shortly after D-day, British Phantom units also functioned for the U. S. Army in the European Theater. The U. S. Army planned to form a phantom force of their own, but the European campaign was won before it could be put into the field.

THE dream of the commanders of past wars has been to know what was happening on the other side of the hill. Today the commander of an army has at his service a tactical air force, specially equipped and trained in visual and photographic reconnaissance. Every aircraft that flies over the battle area is a possible source of information, and if his air force has superior power, the only limiting factor to its usefulness will be the weather.

Nevertheless, however important the air may be as a source of information, it is only one of many from which the general enemy situation is built up. Information will be accumulated by the military intelligence sections; firsthand reports will be available from the commander's own liaison officers in the forward areas. Reliable and timely information is vital to the conduct of operations, and together these various channels should supply it.

Mental Picture of Battle

The commander will need a type of information less easily defined if he is to get the "feel" of the enemy, and is to gain an insight into his mind and intentions from a psychological rather than, for example, a photographic approach. In the British Army this information is supplied by a highly specialized body known as the G.H.Q. Liaison Regiment, which offers a particular contribution to the commander's mental picture of the battle. Its information, which is valuable because it is based on firsthand observation of the enemy in action, is transmitted directly to the commander's own headquarters.

The members of the G.H.Q. Liaison Regiment wear on their shoulders the small letter "P", which stands for "Phantom." In its offensive rôle it is the advance party of the British Army. "Phantom cover" is to be found on every British battlefront, and "Tell us, Phantom!" is the injunction that reaches Phantom patrols through every phase of battle.

What Is Phantom?

The name "Phantom" came from a radio code word —and it well describes the stealthy missions of Phantom patrols through every British battle zone, and sometimes through enemy lines as well. A patrol may consist of no more than a single armored car, manned by an officer and 6 men; but the car will carry highly specialized equipment and each member of the crew will be a radio expert, and much else besides. The patrol will have lateral communication with other patrols, and will be in direct communication with the control station at its own headquarters. From that headquarters will flow a constant stream of information to the commander in chief. His operations map will therefore show within a matter of minutes the latest positions of the farthest-flung front-line troops.

In World War I, Field Marshal Earl Haig had something of the idea of Phantom when he sent junior staff officers to visit the forward positions during a battle and had them report back in person to his headquarters. Employing quite different means, and working more elaborately, Phantom today performs a similar function. The information it gathers often is communicated simultaneously to the local commander and to regimental headquarters. The local commander, in turn, will ask the Phantom patrol in his sector for the latest news of the battle. Phantom has the right of entry to any headquarters. It gets the picture, and is gone.

In Britain's Defense Plan

Phantom did not emerge as a fully developed idea. Its first appearance was in France, in January, 1940, when it operated only for the air force commander. It consisted of troops with armored cars, a platoon of motorcyclists, and intelligence officers, also with motorcycles. Its main mission was to transmit information that would enable the Royal Air Force to play some part in the land battle. When France fell this immature organization became extinct, but between June and October, 1940, it was rebuilt with far wider responsibilities. It was directly employed in the general plan for the defense of Britain.

The founder of Phantom in its new form was Colonel (afterwards Major General) G. F. Hopkinson, who was killed while commanding the 1st British Airborne Division in the invasion of Sicily.

It was he who laid down the lines to be followed in the selection of personnel. He was not primarily concerned with a candidate's soldierly or technical qualifications, nor if his only qualifications were linguistic or academic, just so long as he had character and an adventurous spirit. Character was a first requisite. A junior member of the regiment might be called upon to keep his end up with highly senior commanders in the field, and again, in the lonely search for information during the course of a battle, he would be called upon to show a degree of cool initiative which is sometimes to be differentiated from an act of courage performed alongside one's comrades. If a man had the right temperament, the necessary staff and technical training could follow. A member of a Phantom patrol will almost invariably be bilingual, and certainly a radio expert competent to take command of the technical link. Today the G.H.Q. Liaison Regiment is recruited from the entire British Army, but no member is asked to forego his regimental connections.

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*British Staff Officer.

In the defense of Britain against threatened invasion, the regiment was deployed along the coast, and was in direct radio communication with its headquarters in St. James Park, London, with the War Office, and also with the commander in chief of the Home Forces. Its patrols were attached to local formations rather than to areas, and arrangements were made whereby these local formations were informed as speedily as London of any enemy move within their area. In this defensive rôle Phantom earned the title of "the eyes and ears of the commander in chief." Not until later was it to assume the more adventurous functions conceived by its founder.

ONLY FACTS PURVEYED

The appearance of a Phantom patrol is welcomed by every headquarters within a battle zone, quite possibly because Phantom does not trade opinion, but purveys facts alone. Its reports are exclusively factual, and deal only with plans and the results of operations. Its only barter is information, and every message it sends out has two cardinal features—the source of the information, and the time. Phantom also gives an intercept service to all commanders as a matter of routine.

In the British Army organization, a Phantom patrol is allotted to a corps front, and a patrol to each division within the corps. An offensive patrol, which may number 6 officers and 30 or 40 men, offers an even greater opportunity for the adventurous spirit of the regiment. It is then that Phantom becomes the advance party of the British Army.

When an offensive patrol sets out to fight its "radio battle," it is equipped with cars, motorcycles, and 15-cwt trucks. It carries enough radio equipment to establish out-stations deep in the enemy-occupied country (as in Greece and Eastern Thrace), together with a receiver-link to Britain. It was a Phantom offensive patrol that supplied the sole means of communication between the British and Greek Governments and the local Greek authorities until Greece was liberated. In this same fashion Phantom offensive patrols operated in Persia and Iraq.

Normal patrols operated with the British First Army in Tunisia, with the 1st British Airborne Division in the Sicilian operation, the British Eighth Army in the Western Desert and in Italy, and with the British and Canadian Divisions in the landings in France. Patrols were dropped and fought with Special Air Support troops on all their major missions behind the German lines.

PHANTOM PATROLS ON D-DAY

The value of the G.H.Q. Liaison Regiment was particularly evident during the Normandy landings. Phantom patrols accompanied each of the assaulting British and Canadian divisions and corps headquarters. The first message from the soil of France was received by the Phantom control post in England. It was quickly succeeded by other Phantom messages from the British and Canadian sector. Ultimately its patrols were switched to the Normandy front, and again were first with the news.

During the Falaise battle, Phantom patrols ceaselessly moved back and forth between the jaws of the Gap, and among the British, Canadian, American, and Polish divisions engaged in the pocket. At a time when the German command confessed it had no knowledge of what was happening, Phantom was sending to the Allied Command precise details of troop positions and the locations of German tanks. It was Phantom that gave the Allied Air Forces their bomb lines. Once, a Phantom patrol operated directly between two portions of the same German regiment. Another of its patrols found itself at the actual junction point of the Allied forces, and got through the first message, "The Gap is closed."

At Arnhem, the Phantom patrol consisted of one officer and 4 men in jeeps. A Phantom patrol was first to reach the docks of Antwerp. Phantom was early on the scene in the Ardennes battle. Its patrols accompanied the assault troops across the Rhine, and during the advance through Germany kept the higher command informed of the positions of the leading troops. A Phantom patrol first effected actual contact with the Red Army. One of its officers was the first to get word back about conditions at Belsen concentration camp.

In the minds of those who created and operated it, Phantom is not a piece of mechanism that can be devised by allocating a certain number of men and suitably equipped vehicles to perform a set task. Phantom is an affair of the spirit.

* * * *

Last Word from Wake

As Told to a Member of The Cavalry Journal Staff

by Major Henry Stanley Wilson[★]

From December 11, 1941—three days after the Japs first hit Wake Island—until December 23, when it was captured, the only communication with the island was furnished by a small detachment of army radio personnel. Composed of one officer and 5 enlisted men, it stayed at transmitter and receiver, and, through daily bombings, maintained a 24-hour contact with the outside world until its unofficial sign off.

AT 0530, December 8, 1941, Captain Henry Stanley Wilson, in charge of a small army radio station on Wake Island, telephoned from his quarters to the radio-trailer, which was in position at the airfield.

The sergeant radio operator on duty at the trailer said, "Captain, I don't believe what I'm hearing. It's . . ."

"Put the radio earphones against the mouthpiece of the telephone," Wilson instructed.

The message that was being transmitted in Morse code, in the clear, came over the phone to Captain Wilson in the unmistakable, characteristic sending style of Lt. Colonel Clay I. Hoppough, Signal Corps, Hawaiian Air Force Communication Officer:

"*SOS. SOS. Japs attacking Oahu. This is the real thing. No mistake.*"

Captain Wilson instructed the sergeant to obtain all possible details, and then hurried to the quarters of Major James P. S. Devereaux, U. S. Marine Corps, and commandant of the Marine 1st Defense Battalion on Wake. He woke Major Devereaux, and told him the news.

After a quick cup of coffee, Wilson went to his radio station at the airport and put into effect a plan he had made some time before. When he had come to Wake in October, 1941, he felt that war with Japan was probable. If it came, the airfield where his station was located would be one of the first places the enemy would strike, and for this reason he had picked several alternate positions to which the 1,300-pound, portable set could promptly be moved.

STATION MOVED IMMEDIATELY

At the field, he rounded up the crew of 5 enlisted men, some of whom had been on duty during the entire night. In a few minutes after word of the Pearl Harbor attack had been received, the station was being moved to its first alternate position, several thousand yards from the airfield.

Four hours and 45 minutes later the station was on the air and had reëstablished contact with Hickam Field. The time was 1149.

Six minutes later, at 1155, more than 50 Japanese aircraft attacked the island. They were two-engine bombers, apparently from the Marshall Islands, and flew in low. First, they strafed and bombed the airfield. Eight fighter planes were destroyed on the ground, as well as the Marine Corps' radio installations and a large gasoline storage tank. Bombs fell within 100 feet of where Wilson's station originally had been located.

The planes then flew over the Pan-American installations on a small island which is a part of Wake, bombed and strafed the hotel and radio station, and destroyed both.

During the 15-minute attack, two of the 6 in the radio crew were wounded. Captain Wilson was hit above the right knee by a bomb fragment, which he extracted himself, and Sergeant J. B. Rex was wounded in the back by a bomb fragment while on duty in the radio-trailer. Neither was incapacitated. The only damage sustained by the newly moved radio station was machine-gun bullet holes through the trailer, which housed the receiving unit.

When the Jap planes left, Wilson went to the Pan-American installation to salvage what parts might be of use. He found little that would be of value to help maintain his equipment through the bombings that were to follow daily until the island fell.

During the afternoon of the first day, the station maintained a regular schedule of contact with Hickam Field. That night, fearing that the low-flying Jap planes had spotted the radio-trailer, the crew of 6 again moved the station to a position well removed from the general area of the airfield.

[★] Signal Corps, attached to Hqs. Hawaiian Air Force.

The next day at 1100, the Jap planes returned in force and bombed and strafed the entire island, but this time they flew higher because of antiaircraft fire. A bomb landed within 200 feet of the radio station's new position, but fortunately caused no damage. Believing that the new position had been located, Wilson and the crew again moved the station during the night—an operation that was to be repeated 4 more times, always at night under blackout conditions, before the island was captured after its gallant 16-day stand.

NAVY'S RADIO DESTROYED

On December 11, three days after the first attack, the Naval Radio Station on Wake Island received a direct bomb hit and was totally destroyed, thus leaving the small Army Air Force Communications Detachment, which was a part of Headquarters, Hawaiian Air Force (later the 7th Air Force), the only means of communication from Wake to the outside world.

It now was both apparent and reasonable to Wilson that the Japanese would begin concentrating on locating and knocking out his equipment. For three days prior to the attack, Japanese radios from naval vessels in the vicinity had been very busy "jamming" the air whenever messages were being transmitted to Wilson from Hawaii. When he transmitted, however, the jamming stopped and the Japs listened in. On one of these occasions when Wilson gave the call letters the Japs answered and said: "Go ahead." He then asked for the recognition signal, after which the Japs sent nothing more. (The signal was changed at regular intervals, and the Japs did not have it.)

STATION SANDBAGGED WITH GI COFFEE

After thinking over the situation, Wilson decided to sacrifice the mobility of the portable radio set for its security, and the equipment was dismantled from its truck and trailer, and installed in an incompleted concrete ammunition magazine. This was covered with 8 feet of earth by a bulldozer, and camouflaged with brush. It was impossible to dig in more than 4 feet because water was struck at that level. The entrance to the dugout was sandbagged with sacks of GI coffee. This position was used until the island fell.

NAVY USES ARMY RADIO

On December 12, the day following the destruction of the navy's radio, the facilities of the Army Air Force Unit's radio were made available to the naval commander. A receiver was placed at the navy's disposal, and a keying line was provided from the transmitter. The unit maintained continuous, instantaneous communication for 24 hours a day with Hickam Field, and furnished the navy with the same facilities for contacting Pearl Harbor.

The Japs on December 12 made an all-out attempt to take Wake, Captain Wilson related, but the marines made the operation too costly. The enemy had believed, however, that the attack would not fail, and therefore had broadcast to the world the news that Wake Island was in Jap hands on the 12th.

This Jap report of Wake's fall on the 12th, of course, was received at Wilson's headquarters in Hawaii, which then devised a clever means of determining the truth of the Jap report.

Wilson told the story as follows:

"Colonel Hoppough, who was receiving my messages from Wake on the 12th, thought he detected a difference in my style of sending. Operators have a characteristic 'touch' on the key, which can be recognized, and Colonel Hoppough, having talked by radio many times with me, knew my style. The logical conclusion was that if the Japs *had* landed, and I was sending, I was doing so while a Jap pressed a pistol against my head.

"Colonel Hoppough and I are fortunate in having had as a close friend for many years Major General George Van Deusen, known to us affectionately as George Van. On the 13th, Colonel Hoppough, on the key at Hickam Field sent to me, on the key at Wake, the following message: 'George V wants to know if you are still having heart trouble.' "

"He knew that only I would know who was meant by George V. 'Heart trouble' to me indicated 'Fear.' I concluded that the colonel wanted to know if the Japs were forcing me to transmit.

"I previously had sent the information that we had dug in the radio station. And so, when I answered his message by sending: 'Would like to have you and George V join us for tea in our underground boudoir' it indicated the authenticity of the messages, and that Wake Island had not fallen as the Japs claimed.

"The next day he sent a message stating: 'Congratulations, Hawaiian Air Force had believed you were a temporary guest of the Mikado.' I said to myself 'Not yet.' "

During the 16 days before the island fell, the army crew of 6 kept their radio on 24-hour service by using a shift of three men, one maintaining equipment, one operating, and one standing by.

The Japs attacked at least once, and sometimes twice a day, with never less than 35 planes, and usually 50.

No request was ever made from the station for help —only reports on conditions were sent. These included messages concerning the tactical condition, weather information, a few casualty lists, type and number of raiding aircraft, direction from which they attacked, and damage.

By December 23, having "lost face" in the 12th's attempt, the Japanese were ready for an overwhelming effort against Wake Island. Wilson said that it appeared as if the entire Jap navy was attacking, and that the island was surrounded with a ring of steel. The air was black with planes.

In order to get troops ashore, the Japs rammed two perfectly good destroyers onto a reef, wrecking them but enabling troops to clamber over the decks and jump down into shallow water about 100 yards from the beach. Wilson said that he saw a marine officer on Wake bore sighting a 3-inch piece at point-blank range at the two destroyers. He was hitting them some damaging blows with his unorthodox shooting until the Japs landed and captured the gun.

The last official act of the valiant crew of 6 army radiomen as soldiers of the United States until their liberation as POWs was to destroy all codes, by burning; all cipher devices, by dismantling and throwing into the ocean; and the radio transmitter, by burning out the power transformer and smashing all meters.

Personal Contact With the Japs

Captain Wilson's first personal contact with the enemy occurred when he was interrogated. First, he was asked why he had destroyed the radio transmitter.

"Very obvious," he answered. "So you could not get it."

Next he was handed a coded message and asked to translate it. He replied he was unable to because he did not have the code book.

"Where is it?" the Japs asked.

"I burned it."

"*Burned* it?" the Japs repeated, as though amazed.

They then wanted to see the ashes, and Wilson led the way to them.

The questioning continued, concerning various phases of communications, but the Japs continually returned to the burned code.

Wilson finally told them—emphasizing the word "modern"—that it was the custom in all modern armies when capture was imminent to destroy anything which might be of value to the enemy. "Of course," he added, "I don't know whether you do that in the Japanese army, or not!"

"Oh yes, oh yes, in Japanese army, too," he was hastily informed, which ended the questioning about the code.

Wake Capture Costly

Wilson told of conversations he had with Japanese naval officers on Wake, who said that the Americans fought very well. He asked, "Well, what the hell did you expect?" The Japanese commandant who captured the island repeated: "Fight very well."

Wilson then asked him how much it cost the Japs to capture Wake, and he replied: "Too much." Wilson insisted: "How much?"

"Twenty-nine airplanes, 9 warships, 5,000 Japanese sailors."

The captain was on Wake when the U. S. naval task force shelled and dive-bombed the island on February 23 and 24. The Japs at the time were using a captured marine 5-inch coast defense gun. During the heat of the attack, the gun stuck in recoil position, and the Japs could not get it back to battery position.

They came and got Wilson, and took him through a heavy American attack to the gun and told him: "You will fix."

He explained that he had never seen one of the guns before—he was a signal corps officer. The Japs then handed him a book marked "Confidential," and which contained a detailed description of the gun's assembly, disassembly and maintenance.

"You must study hard," the Japs said.

The attack had not lessened; Wilson did not like it.

He was thumbing through the book trying to look studious, when he came upon a picture of the breech section in which an arrow pointed and a caption said: "Do not remove this plug. If you do the hydraulic fluid will be lost from the cylinder."

Quickly turning to another part of the book to conceal the picture, Wilson began experimentally fumbling around on the gun, and then started unscrewing the plug. It shot out in his hand, and out came the fluid.

The Japs took one look at him, and then led him by the arm back to the camp. When he left the island three months later, the gun still was in recoil position.

During his 5 months on the island before he was sent to prison camps in Japan, Wilson watched the Japs use American civilian contractor personnel and blueprints in a continuation of the projects that were under way prior to the capture of the island. Such work was carried out to the completion of an entire new runway for the airfield. The Japs, however, were unsuccessful in dredging out the turning basin for the submarine base.

The 5 enlisted men who served through the entire period of the siege of Wake Island, Captain Wilson said, were outstanding in their devotion to duty amid trying conditions of poor food, little or no sleep, and under daily air attack. No single complaint was ever made by them either to him or in his presence.

The records roster of the group shows that two, previously mentioned, were wounded. The 5 enlisted men have been recommended for the Silver Star, and Wilson for the Legion of Merit awards.

The 5 enlisted men were Staff Sergeant E. G. Rogers, Air Corps; Staff Sergeant C. H. Hotchkiss, A.C.; Sergeant C. W. Dilkes, A.C.; Sergeant J. B. Rex, Signal Corps; and Pfc. P. F. Fultrup, A.C.

During his captivity Wilson suffered bacillary dysentery, beri-beri, edema, and chronic diarrhea, and weighed 97 pounds when liberated by the U. S. Eighth Army on September 7, 1945, following which he was returned to the States.

Last Word From Wake

It was Wilson's station which sent the famed message during the time of siege: "Send us more Japs." This was sent when a naval officer used the words to "pad out" a line in an official message.

Wilson himself was at the key to send the last word that went out from Wake which was—also unofficial—"The Japs have landed, and the issue is still in doubt."

Four Armies Trained by Great Britain

by Major Ernest Watkins[*]

It is sometimes suggested that Britain entered the war unprepared. It is quite true that Britain was unprepared for the war that actually happened, but that is true of every nation that took part in it, Germany included. In fact, one of the causes of Germany's final defeat was that when she created and built up her Luftwaffe she failed to provide the right kind of offensive or defensive force for operations in the air.

AN army depends on men and equipment. The disadvantage under which the military chiefs of the Western Allies labored before the war was that they were required to prepare for a war under peacetime economic regime, whereas their opponents had already created wartime economies. In 1938 and 1939 the General Staffs of France and Britain had planned that the British contribution to their joint land forces should be some half dozen infantry divisions, available at the outset of the war and to be under the command of and subordinate to the French Army. That was provided. Four British Divisions landed at Cherbourg in September 1939 and a fifth was formed in Flanders in October of the same year. They were fully mechanized and equipped and perhaps the worst criticism that can be made is that their infantry was deficient (again in common with their Allies) in effective antitank defenses. They were already equipped with the 25-pounder field gun, which remained, unmodified, in full and effective use during the remainder of the war, and the 5.5-inch medium gun, also unsurpassed throughout the whole war, had already been designed, although it was not then in full production.

Until 1939 the British plan for defense rested on two armies, one a small professional army, always trained and equipped, the other a volunteer Territorial Army of part-time soldiers, as a second line. In 1938 that Territorial Army had been doubled in size and had been given responsibility for the manning of the coast and antiaircraft artillery within Britain itself, two tasks for which it was fully prepared by September, 1939. In March, 1939, there came the major break in British tradition. Britain introduced compulsory military service as a peacetime measure and by May, the first "militia" were in training, and some of those men were in action in France later that year. In addition 7 Territorial Divisions landed in France before May 1940, some not fully equipped and sent for training and pioneer duties, but others complete. All of them fought in the battles before Dunkirk.

That phase of the war came disastrously to an end at Dunkirk. The equipment of the whole force was lost and only by a miracle were some 300,000 men brought back to Britain. The British Army faced an entirely new task. They had to prepare for war all over again, this time with the enemy at their gates, encircling their base with his submarines and bombing the war factories with his still unbeatable air force.

It is at this point that the earlier British plans for supply became important. The expansion of British industry for war had started as far back as 1936, with the creation of what were known as shadow factories These were largely duplicates of existing industrial factories, sited away from the main centers of production and in any case dispersed so that no bombing of an area would cripple any one industry. Each factory needed only two essentials, that it should have access to a railway and that it should not be too far away from an existing center of production, so that a labor force could be brought in each day without the necessity for extensive rehousing. By 1940 most of the factories were under construction. A great many were already in production. By the spring of 1941 the existing British Army had already been largely re-equipped.

But now it had to prepare for another kind of war, or, rather, for two kinds of war. The British Army was committed to the defense of the eastern end of the Mediterranean, and, ultimately, to the recapture of the whole of the Mediterranean area. It was also conscious that some day it would have to undertake a landing on the coasts of German-occupied Europe. Where that landing would be, and when it would be made were matters which could not then be determined, but the fact that in the winter of 1940 mass production of engines for landing craft was started is evidence that the determination to return to Europe to defeat Germany was already a fixed element in British strategy. There was no other way in which the war could be won, even were it to last 20 years. The German attack on Russia and the United States changed the details of the plans, and made their fulfillment so much more possible, but it did not change the pre-existing resolve.

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[*] British Army Bureau of Current Affairs.

But after December 1941 the British Army was freer to plan and train for specific operations. The first difficulty was to give adequate training for battle troops who had not been in battle and yet who would have to face in their first engagement veterans of many wars. It was impossible to send every division for a tour of duty in the Middle East. Shipping did not permit of it. So the Battle Schools came into existence.

The basic idea of the Battle School was to introduce into the training of the soldier some of the actualities of war, the physical conditions of combat, the sounds of battle and some of the risk. Live ammunition was used. The men went into the training exercise behind their own artillery barrage and there was an enemy, in German uniform, firing over or to one side of them so that men were literally under fire. Mines were exploded in their faces, and there were air attacks.

As time went on the idea was expanded. By 1944, men, British and American, were training for assault landings under conditions almost identical with those they were likely to meet on the section of the European coast chosen for the 1944 assault. Every enemy defense strong point and device had been duplicated. Hundreds of acres of British farmland and pasture had been turned over to exclusive military use and had been ravaged by explosions. Every assault division went through this training.

Side by side with this general training were the Commando operations from 1941 onward. The raids across the Channel, from the small assault on Bruneval to the large scale attacks at St. Nazaire and Dieppe, were not only important in themselves. They were experiments of the greatest value to the later main assault and they were also object lessons that helped to build up the confidence of the whole of the Army. What could be done by men in the Commandos could be done by any soldier, so the soldier came to believe, and he was right.

It is interesting to look back and contrast the equipment available in 1940 with that used in 1944, for nothing shows more clearly the change in tactics and training that had taken place over that period. And with each piece of equipment one must bear in mind the story of its development, first the tactical need for it, then the designing of the thing itself, and the problems of mass production and finally the training of the men in its use, all in a period in most cases far shorter than 4 years.

The infantry needed antitank guns. The 6-pounder and the 17-pounder guns were designed and the infantryman had to become a gunner as well. A short-range antitank weapon was needed, and the PIAT was devised and supplied. The German mine became a difficult obstacle, so an electric mine detector came into being. Portable flame throwers were produced, for town fighting and the reduction of concrete strong points. Never had the infantryman had so much to learn.

So with mechanized forces, tanks themselves were improved, and became specialized. There were flame-throwing tanks, mine-clearing tanks, tank for engineers, fitted with heavy mortars, and finally amphibious tanks, first used in the sea-borne landing at Walcheren in November 1944 and playing a great part in the Rhine crossing in March.

Artillerymen had finally given up their horses before the war. Now they had to become drivers of armored tracked vehicles as well as of wheeled, for the self-propelled gun became a necessity in battle. Not only that, the gunners became airmen as well. Air observation aircraft were piloted by army officers who flew the machines and, by means of radiotelephony, gave the fire orders to their batteries on the ground as they did so.

Perhaps the most vital service, and one too easily overlooked, is that which maintained this complicated equipment in action. Mechanical, electrical, optical, every kind of machine used in the Army is repaired and maintained within the Army, and the men of the Services responsible for that work had to train as soldiers and as craftsmen. The whole technical teaching resources of Britain were thrown into the effort to supply the Army (as well as the Navy and the Air Force) with the technicians it needed.

No account such as this would be complete without some reference to the women who became part of the Army, the Auxiliary Territorial Service. Each replaced a man. At first the jobs they were given were jobs not directly concerned with operations, such as clerks, cooks and storekeepers. But from the very beginning they were driving vehicles under every kind of condition. Then, as an experiment, they were introduced into the fighting sections of antiaircraft batteries, and took over the instruments as opposed to the guns. Mixed regiments were formed, in which women were the majority, and the results they achieved in the flying bomb attacks on Britain were remarkable. At the end of the campaign mixed batteries of men and women were shooting down at night 85 per cent of all possible targets.

Britain in this war, in addition to the vast Navy and Air Force, has trained and equipped four armies: the Army that fought in France in 1940, the Army that drove the Germans from North Africa in 1942 and 1943, the Army that landed in Normandy in 1944, and the Army that destroyed the Japanese in Burma in 1945. Each Army needed different equipment and different training, and each Army, sometimes alone, sometimes as part of a larger Allied force has been victorious. The British have shown once again that while they are not a military nation they are a warlike people.

PRO Pays Off in Battle

by Major Harold D. Steward*

PUBLIC relations pays off in battle. Combat officers, from a platoon leader up, will verify this. They will agree that soldiers are proud of receiving public credit for their exploits in battle, and that a story in a soldier's home-town newspaper is a great boost to his morale.

Men also like to hear about their unit on national radio networks, read about their outfit in the national magazines, and know that their unit's name is, in general, before the American public.

To accomplish this is the job of the army's public relations officers. To show how it is accomplished, this article outlines how the 1st Cavalry Division's public relations setup was operated through both the Southern Philippines and Luzon campaigns.

In early October, 1944, about 10 days before the 1st Cavalry Division embarked from the Admiralty Islands for the Philippines invasion, 15 war correspondents arrived at division headquarters. The PRO and his staff, which at the time consisted of three enlisted men, were charged with receiving and taking care of them.

Orientation of War Correspondents

Arrangements were made immediately for the war correspondents to be briefed on the upcoming Leyte invasion. The briefing, although secret and "off the record," gave the correspondents a better understanding of the war story they were soon to cover. The newsmen then were furnished with a history of the division and biographical sketches of the division's general officers and regimental commanders. These the correspondents filed with their offices in advance.

In the days preceding the embarkation for Leyte, the correspondents were taken on an extensive tour throughout the division area and introduced to the various commanding officers and to the men. This later proved a great help in coverage.

During this time, and later aboard the transports en route to Leyte, the public relations staff had been writing advance stories on the soldiers who were to make the Leyte landing. These stories would be available for use after the landing, when it could be publicized that the 1st Cavalry Division was committed in the action. They included such information as what the soldier's job was with the division, what his personal feelings were about returning to the Philippines, and his complete home-town address.

For transportation, the public relations office had been allotted a jeep and a three-quarter ton weapons carrier, which were combat-loaded on the ships since they would be needed the moment the landing was effected.

Signal Corps Photo

A combat movie cameraman photographs a light tank of the 754th Tank Battalion firing at Japanese positions.

PROs Land With Assault Troops

On D Day, October 20, 1944, the public relations staff and war correspondents landed with one of the first three waves. (It is imperative that public relations personnel go ashore with assault troops, for news events are in the making and PROs can be of assistance to war correspondents.)

Each PRO member landed with a different unit, and immediately began gathering the routine "first" stories —who was the first soldier ashore, the first officer, who killed the first Jap, etc.? These stories were furnished the war correspondents in hand-outs. That night the PRO staff and the war correspondents slept in a hut on the beach.

On D Day plus One the 1st Cavalry Division's public relations office was set up in an old building on the road to Tacloban. Tables and chairs were provided for the correspondents, and rations were brought up in the weapons carrier.

On the night of D plus One, Major General Verne D. Mudge, division commander, held his first press conference. The conferences were continued almost daily thereafter, and did much to keep the Division in the news each day, and also won the favor of the correspondents.

The speed with which news moves determines much of its value; therefore one of a PRO's first considerations must be the establishment of a quick method for sending out the stories of war correspondents. In the Leyte campaign, the stories were delivered by a jeep messenger to a central station on the beach, and from there delivered by an LCM to a radio ship offshore from which they were flashed to the home offices of the correspondents.

On D plus Two, the public relations office was established in the Leyte Normal School building in Tacloban. Some of the correspondents were quartered there, and others stayed in civilians' homes. All ate with the 1st Cavalry Division headquarters company.

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*Former 1st Cavalry Division Officer.

A daily news hand-out on the military situation was written by the PRO, and distributed among correspondents. The best feature stories written by PR personnel were turned over to the correspondents, since copy filed by them always gets a better play in the states.

After leaving Tacloban, the PRO staff and correspondents lived in a tent, from which a messenger service for correspondents' stories was operated daily.

To operate effectively, a PRO must establish a working system; however, he must still plan moves ahead of time. When a big story is about to break, he must inform correspondents in advance, and arrange for the facilities they will need to cover it. And, to repeat, he must see that the stories are transmitted.

To illustrate, the commanding general of the Division received word on January 29, 1945, that the Division would move on Manila. This gave little time for arrangements, which were carried through as follows:

Coverage of the "Flying Column"

First, the war correspondents, who were at GHQ 60 miles away, were notified barely two days ahead of time that the Division would begin its race for Manila at midnight, January 31. Fourteen correspondents signified their desire to accompany the now famous "Flying Column."

The radio transmitter that would be used to send the stories out was located at the GHQ public relations office. It was necessary, therefore, to arrange for them to send a courier to the division's rear echelon, where he would pick up the stories that were sent back from the advanced echelon. En route, the division PRO operated in two separate sections. One of its jeep messengers, at one time, was traveling 75 miles to the rear echelon, and another the 60 miles from the rear echelon to the GHQ radio transmitter station.

On the way to Manila, Major General Mudge held a press conference each night to keep correspondents informed on the military situation.

When the city was reached a field artillery liaison plane was used to transport the radio correspondents, as well as the written stories of correspondents, to the transmitter at GHQ. The result was that news coverage on the 1st Cavalry Division beat that on other units by more than 24 hours.

The liberation of prisoners at the Santo Tomas University internment camp drew practically all of the war correspondents in the theater, and to these the division PRO was a host, whose duties included rationing and quartering them on the spot.

During this time the division public relations personnel, which had been increased to 5 enlisted men, were kept busy writing feature stories on the division and the men in it. Again the best feature stories were given the correspondents, and were invariably used.

News releases on every officer and man that entered Manila with the "Flying Column" were sent immediately to home-town newspapers, and because they were timely, got a pretty fair play. To get them out fast, troop clerks were pressed into service.

In addition to caring for war correspondents and preparing hand-out releases, the public relations section continually wrote stories about decorations and promotions. The stories behind the awards of the higher decorations were turned into general releases for the correspondents.

General PRO Problems

When publicizing any military unit, whether company or army, a public relations officer must slant his material for a possible use in all publishing media, and not concentrate his efforts on newspaper publicity alone. The other media are magazines, motion pictures, still photographs, radio networks and individual stations, and books. Magazines are on the lookout for feature stories about units which are built around one or two of its outstanding individuals; radio networks will use spot news, spot news features, and interviews with men who have done the unusual; motion picture and still cameramen always welcome any idea that will lead to good news or feature pictures; many war correspondents are writing books and will welcome material to include in them.

PROs should avoid "polishing the brass"; that is, spending a great deal of time writing about the high ranking officers in the unit. No story should be written unless it will stand up to a news or feature test. Only about 10 per cent of a unit is officers, and therefore 90 per cent of the releases should be about enlisted men.

In the 1st Cavalry Division the Public Relations Officer worked directly under the Chief of Staff as did other staff sections. This plan worked well, and apparently is the best. It puts the PRO on a par with the other staff officers, which is a decided advantage. A PRO should also have a separate office rather than working in one with some other section.

The biggest public relations problem is obtaining personnel. PR operates without a T/O, and personnel is obtained from other units on a temporary or attached basis. Once the value of a public relations setup is proven to the commanding officer, however, the needed personnel will be forthcoming. This is especially true while a unit is in combat.

There is no set of rules to follow in handling publicity for a unit, and a PRO must make his policies as the various problems present themselves. For this reason a policy book should be formulated for the section as work progresses; from time to time it will be of great assistance.

The reward to the Public Relations Officer for his work is the self-satisfaction that comes from seeing that his unit gets public credit for what it does in battle.

JOB TRAINING

by 1st Lieutenant Walter J. Schweitzer*

THREE HUNDRED students are enrolled in on-the-job training courses at Fort Riley, Kansas. The newly inaugurated program is designed for the reëducation of men who have been away from their work for any extended period of time. A secondary purpose is to provide a sound foundation for further technical school training should an individual desire to take advantage of the education provisions of the GI Bill of Rights.

A board of officers has been organized for the purpose of coördinating the effort among the various departments of The Cavalry School, which has been called upon for instructors, material and its many other facilities that are available for instructional purposes. The board is headed by Lieutenant Colonel James F. Hollingsworth, of Fort Worth, Texas, who is assisted by Captain Jewett A. Dix, of Fort Lauderdale, Florida; Captain Lester B. Johnson, of Kansas City, Missouri; and Captain Albert W. Ackroyd, of Cuyahoga Falls, Ohio.

The new program offers 13 practical courses in:

Major General I. D. White, second from left, commandant of The Cavalry School, discusses the merits of the drafting course with students. On right, a warrant officer-instructor is helping student work out a problem in projection.

An education program to train soldiers for rôles in civilian life has been established at The Cavalry School and School Troops at Fort Riley, Kansas. Students attend voluntarily, and 13 courses are available, ranging from the intricate subject of radio maintenance to one for the equestrian.

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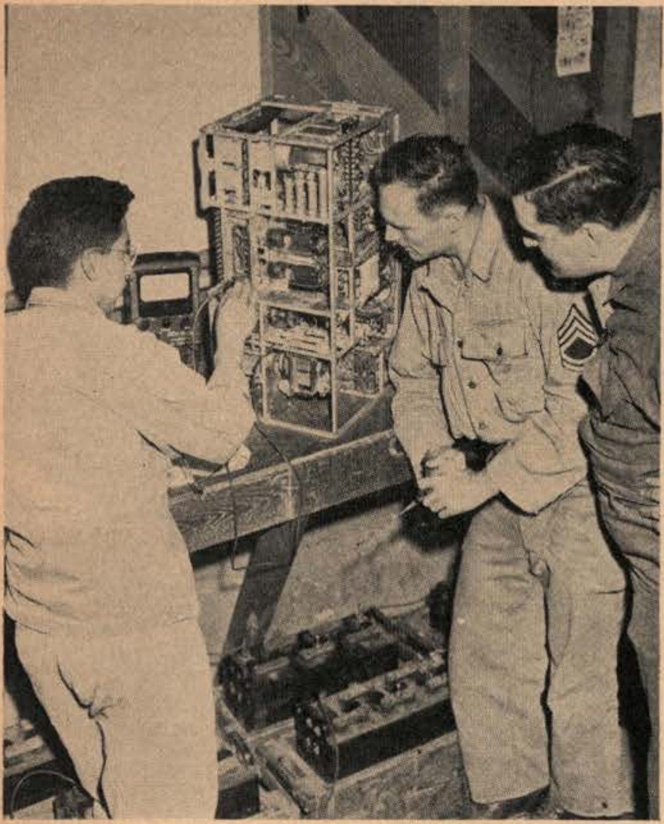
*Public Relations Officer, The Cavalry School.



Students check the circuit on a modern radio transmitter to locate shorts or breaks preparatory to making repairs.

Both electric and acetylene welding instruction is offered in the new educational program at The Cavalry School. An instructor watches as a student brazes a handwheel.

radio maintenance, auto mechanics, horsemanship, carpentry, painting, photography, drafting, printing, electrical work, plumbing, refrigeration, welding, and machine-tool operation.

Particular care has been taken to formulate a well-rounded course in refrigeration. Because of the coming emphasis in the postwar home on deep freezing, air conditioning and modern refrigeration, wide opportunities will be offered men trained in this field. The same can be said for the radio course, which embodies many related subjects, including radio operation, maintenance, electronics, television and frequency modulation. Regardless of the course chosen for study, the individual has available professional training and facilities seldom offered anywhere but in the army.

A study hall has been provided for students who desire to apply themselves beyond course requirements. It is shared by others who are enrolled in the multiple academic courses offered by the U. S. Armed Forces Institute. The courses taken by these students will enable them to receive a high school diploma, or better prepare them either for entrance into college or for work toward a college degree.

Many of the Fort Riley students are learning a new trade. The army is thus offering them a chance that to a civilian would be a gamble. As Corporal L. L. Stevans, of Marblehead, Mass., puts it: "The training offers a big advantage, for should anyone fail in any of the courses offered, he may change to another. As a civilian he could never afford to take that gamble."

As an example of how the courses are fitted to future jobs, students in the auto mechanics course work with various types of civilian vehicles rather than with army vehicles. In the printing course, a student sets up the type, makes the necessary adjustments on the press, and carries a press job through to completion.

Many prospective students are consulting 1st Lieutenant Richard C. Reidenbach, of Rochester, New York, Information & Education Officer and in over-all charge of the program, for advice on the courses offered.

A civilian instructor points out the function of the parts in a combustion engine to two students of auto mechanics.

INTERNAL COMBUSTION ENGINE - CMC

ARMORED DIVISIONS IN WORLD WAR II

1st—"Old Ironsides"

The 1st Armored Division tasted heartbreaking setbacks in North Africa but fought on to a smashing victory. Later it went to Italy where it fought before Cassino, landed on the Anzio beachhead, and led the push to Rome. It kept on going over the Apennines to Bologna and Milan and across the Swiss border. It has been selected for occupation duty in Germany.

2nd—"Hell on Wheels"

With a total of 1,091 officers and 2,146 enlisted men with decorations, the 2nd Armored Division is proud of its combat service in the invasion of North Africa at Casablanca, the battle for Tunisia, the invasion of Sicily at Gela and the invasion of Normandy. It fought across France, Belgium, Holland and finally into Germany and occupied a section of Berlin after VE-Day.

3rd—"Spearhead"

"Firsts" claimed by the 3rd Armored Division are: first to cross the German border, September 12, 1944; first to take a German town, Roetgen; first to break the Siegfried Line (by Task Force "X"); and first to invade the "sacred" soil of Germany since Napoleon. The 3rd fought from St. Lô to Mayenne and Chartres, past Château Thierry to Mons, then to Liége and Aachen. Major General Maurice Rose, commander, was killed in action.

4th—"Breakthrough"

For relieving the trapped 101st Airborne Infantry Division at Bastogne, the 4th Armored Division and attached outfits received the Distinguished Unit Citation. In more than seven months of fighting, spearheading the fast-moving Third Army, the 4th Armored swept from Normandy to Brittany to Lorraine to Germany. It made a notable 120-mile run to smash Von Rundstedt in the Ardennes.

5th—"V for Victory"

Long drives of 300, 130, and 100 miles featured the overseas service of the 5th Armored Division which fought at St. Lô, Le Mans, the Seine, Compiègne Forest, the Moselle, and in the December "Battle of the Bulge."

6th—"Super Sixth"

Landing at Omaha Beach in Normandy in July, 1944, the 6th Armored Division helped open a liberation path from Brest to Bastogne along the road to Berlin. It fought at Avranches, Lorient, Nancy, Metz, Bastogne, Weimar, Jena, and Gotha.

7th—"Lucky Seventh"

A valorous stand by the 7th Armored Division in Holland saved the British-Canadian Antwerp campaign by stopping a strong German counterattack. This division fought at Château Thierry, Rheims, against Von Rundstedt at St. Vith, and sliced across Northern Germany to the Baltic.

8th—"Iron Snake"

First taste of battle for the 8th Armored Division came in the Moselle-Saar salient. The 8th went to the relief of the British "Desert Rats" at Roermond, Holland, crossed the Rhine on March 27th, 1945, and overran a number of German cities, smashing the 116th Panzer Division en route.

9th—"Phantom"

Called the "Phantom" by the Germans, the 9th Armored Division seized the Ludendorf Bridge across the Rhine at Remagen, a feat which shortened the war by months. The 9th fought at Bastogne, St. Vith, Limberg and Leipzig.

10th—"Tiger"

First division in the Third Army to enter Germany, to capture a major German city—Trier, and to stop the Germans at Bastogne during the Ardennes breakthrough, the 10th Armored Division bagged 30,000 prisoners and took 450 towns in five months of combat.

11th—"Thunderbolt"

The "Battle of the Bulge" had just begun when the 11th Armored Division landed in Normandy and reached the Bastogne-Neufchateau area by a forced march. Battles in Belgium, Germany and Austria followed. In these battles the First and Seventh German Armies were destroyed.

12th—"Hellcat"

The 12th Armored Division takes pride in its capture intact of the bridge across the Danube at Dillingen and in its 37-day drive in Bavaria, during which it conquered 22,000 square miles, captured 63,000 Germans and freed 28,000 persons, to clear a path from the Rhine to Austria.

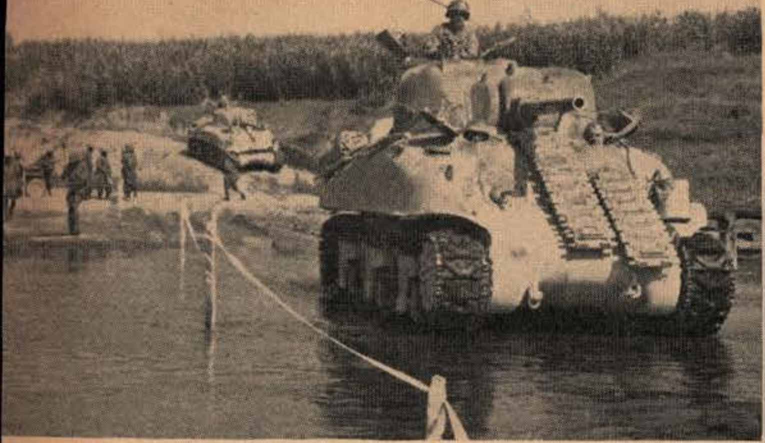
13th—"Black Cat"

The 13th Armored Division joined General Patton's Third Army in the closing stages of the drive to southern Germany, a surge that by-passed Berchtesgaden in the push to link up with the Russians. It crossed the Danube near Regensburg and was at Branau when Germany capitulated.

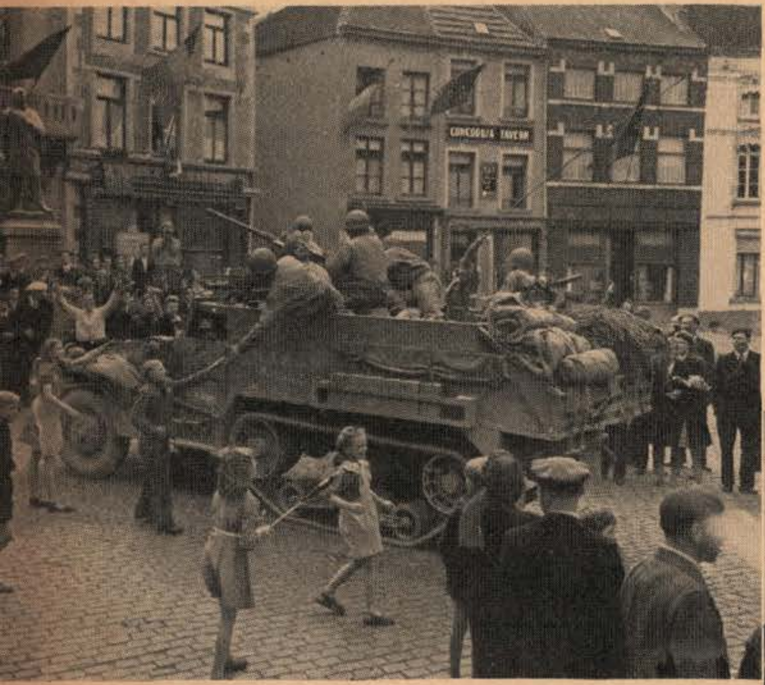
14th—Capturing 50,000 Germans, liberating 200,000 Allied prisoners, wiping out 450 German tanks and freeing 1,000 enemy-held towns, the 14th Armored Division drove 500 miles across the continent of Europe. It fought at Rittershofen, Neustadt, Schweinfurt and Moosburg.

16th—Eight thousand prisoners per day—that's the average for the 16th Armored Division. But the 16th was in combat only one day, at Pilsen, Czechoslovakia, where it made the big haul. The war ended before the division could go on.

20th—Although only briefly in combat in Europe, the 20th Armored Division served well under the Seventh Army, aiding in the drive on Munich, the capture of Traunstein, and the smash into Salzburg where it made a prize catch of Nazi generals.

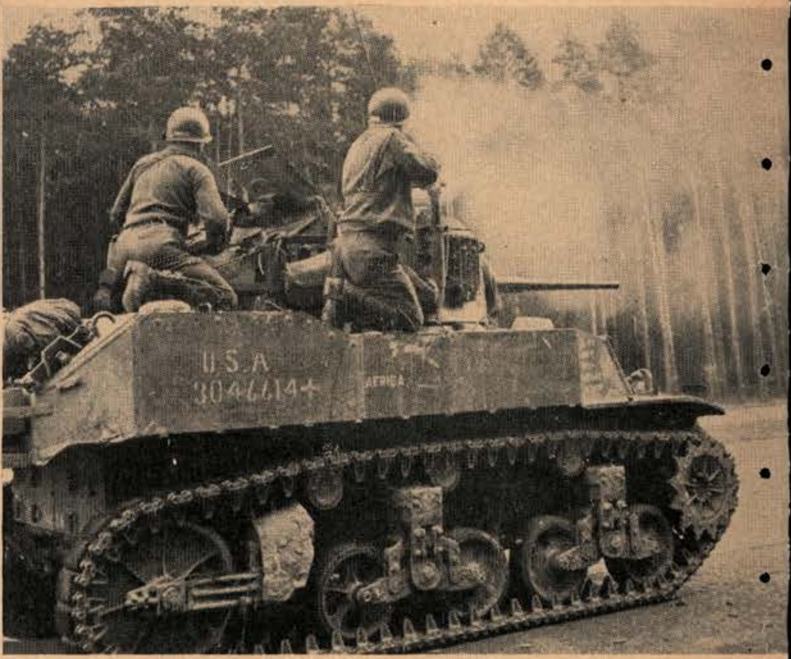


An M4 tank of the 1st Armored Division, Fifth Army, crosses the Arno River ford in the Cascina area in Italy, September 1, 1944. Note other tanks on roadway.



A half-track of the 2d Armored Division, 41st Armored Infantry, is received by the joyous Belgians as the vehicle enters Soignies, Belgium, on September 12, 1944.

A 3d Armored Division tank machine-guns snipers in a woodland site while en route along the Autobahn that leads into Dessau, Germany.



Tanks and other armored vehicles of the 4th Armored Division halt momentarily in the open, flat countryside on a roadway that is near Contheil, France in December, 1944.

Book Reviews

THE NEW VETERAN. By Charles G. Bolte. Reynal and Hitchcock. $2.00.

Mr. Bolte was born in New York, grew up in Connecticut, and was graduated from Dartmouth in 1941. He did not wait for the United States to declare war on the Axis, but joined the British Royal Rifle Corps as soon as he received his diploma. He served a year in England, another in Middle East under Montgomery, fought against the North Afrika Corps and was wounded at Alamein.

On his return to the states he headed the American Veterans' Committee, made up of veterans of World War II. The Committee, which has as its slogan "Citizen first, Veteran second," has conducted a vigorous campaign against racial discrimination and has aligned itself with progressive groups.

The New Veteran is a coherent and intelligent presentation of the aims and ideas of a segment of our veterans of World War II.

In his first chapter Mr. Bolte quotes a statement made in 1920 by T. E. Lawrence: "We lived many lives in those whirling campaigns, never sparing ourselves any good or evil; yet when we had achieved, and the new world dawned, the old men came out again, and took from us our victory and remade it in the likeness of the former world they knew. Youth could win, but had not learned to keep, and was pitiably weak against age. We stammered that we had worked for a new heaven and a new earth, and they thanked us kindly, and made their peace. When we are their age, no doubt we shall serve our children so."

In a "Speech To Be Made After the War" the author explains why his own group joined the English army: "We went with no ideal of crusaders, without thought that we were fighting for a brave new world. There was no rosy-cheeked feeling in us of dying for an ideal, and little romance. . . . We felt we would be hard to disillusion, because we had no illusions.

"We had been well educated by honest books about the last war, and by parents and teachers who taught us that there is no good war, because in war no one wins. Then when this second war came, the war they had made inevitable by their refusal to accept the responsibility of having won the last war, they were distressed that we had absorbed their teaching, and called us weak, idlers and cowards.

"We reacted against their charges, and perhaps took longer to make up our minds than we would have taken if they had left us to do our own thinking. When we finally decided, when our convictions got the better of us—aided by our impulses, which had always been on the right side —we went.

"We didn't expect to like the army or anything about it. We went because the war was the big thing of our time and the soldier had again become the man who really moved things and decided issues: decisions subject to revision or even discard by politicians, by people at home, or by us when we were dog-tired of foreign countries after a foreign war; but nevertheless decision of the moment which soldiers alone could settle by force of arms."

In his explanation of the aims of his organization Mr. Bolte states:

"We are concerned with the military problem of security, the political problem of freedom, the economic problem of welfare, and the moral problem of justice. The problems are interrelated; their solution adds up to peace. But any easy dream of a brave new world will shatter, because there are too many concrete facts of existence and established order standing in the way of sudden change. Moreover, this country went to war because it was attacked by Japan and had war declared on it by Germany and Italy; if anybody is willing to fight for national survival alone, he is justified. But most of our allies are fighting for something better, and I think a lot of us are.

"The concept of a better world is not an idea or a dream: it is a matter of political necessity. . . . We can't expect everyone suddenly to become logical, and take the necessary steps over the obstacles which block the path to peace. I hope instead of deploring this fact we work with it and, like a good minority in a democracy, work until we make the majority change its mind and we in our turn become members of the new majority."

These excerpts give a general idea of the type of thinking to be found in this book. There are statements made which will not be concurred in by all readers, there are criticisms which may or may not be too harsh, but on the whole the book contains constructive rather than destructive ideology, well coordinated and well expressed. As an expression of the aspirations of a substantial portion of the new fighting generation, it warrants respectful attention and consideration.

* * *

THE CIANO DIARIES: 1939-1943. By Count Ciano. Doubleday, Doran. $4.00.

It is difficult to see why this important document should have been mangled and emasculated in the public press prior to its complete and unexpurgated publication. One can only hope that this premature release will not deter a large portion of the American public from giving careful attention to this important account of Italy's political and diplomatic involvement in the European imbroglio.

Count Ciano was one of those who distrusted Germany, but he was, to quote Mr. Wells in his excellent introduction: "The amoral product of a wholly decadent period in Italian, and, for that matter, in European, history. To him morality in international relations did not exist. He was wholly seized of the concept that only might makes right . . .", as a result he was unwilling actively to fight the dictator, although he consistently opposed Italy's entry into the war."

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THE CAVALRY JOURNAL

These diaries were undoubtedly written with an eye to publication, and it must be recalled that Ciano was at one time a writer on the staff of a Roman daily paper. There undoubtedly is much that they do not tell, and much that they do tell is so shrewdly worded that one phrase balances another.

The authenticity of these diaries is attested to in his excellent introduction by Mr. Wells, to whom Count Ciano showed them in 1940.

* * *

WAITING IN THE NIGHT. By George Millar. Doubleday, Doran. $2.75.

Perhaps the most interesting stories of this war are those of the resistance movements kept alive in the European countries under German occupation. Underground workers were often recklessly brave, frequently foolish, sometimes unschooled in war, sometimes strong, at others unexpectedly weak. Their stories are often tragic, but never dull.

More than most *Waiting in the Night* brings out the human weaknesses of untrained civilians that must be overcome in order to coordinate successful armed resistance.

George Millar, an Englishman who had escaped from the Germans, was parachuted to France in June, 1944, to join the Maquis. He worked with several groups in the Besancon area, teaching the Maquisards the use of the firearms sent them, arranging for supplies, and directing sabotage.

His book is extremely well-written, and the characters who move through its pages become alive as he skilfully emphasizes their peculiarities and tolerantly views them as individuals with different natures, varied backgrounds, and distinct contributions to make to the cause of French liberation.

* * *

FOUNDATIONS OF NATIONAL POWER. Edited by Harold and Margaret Sprout. Princeton. $4.25.

The editors of this book are the well-known authors of *The Rise of American Naval Power* and *Toward a New Order of Sea Power*. Harold Sprout is a professor of politics at Princeton University, but during the war he has devoted most of his time to the Navy Department, the War Department, the Department of State and the OWI.

The book is described as "readings on world politics and American security." Its introduction states: "The Second World War has altered profoundly the relations of the United States with other nations. Venerable foreign policies—such as neutrality toward European wars and avoidance of military alliances with foreign powers—require fresh appraisal in the light of changing conditions." The material has been culled from the statements of authorities on world conditions and political and economic history in order that the thinking American may be informed on the subjects pertinent to the nation's responsibilities in the world's new order.

THE BASIC MANUAL OF MILITARY SMALL ARMS. By W. H. B. Smith. Military Service. $5.00.

When the first edition of this extraordinary compilation of small-arms information was originally published, it was hailed as one of the most valuable books on domestic and foreign small arms. In its expanded edition it becomes even more important to the soldier, collector, manufacturer and designer as well as the non-expert interested in the subject.

Correlating information otherwise only obtainable in scores of manuals, many of them unavailable, this book was originally published to give our men in a single volume the material to enable them to identify and operate their own and captured enemy weapons. It should be included in every military library.

The remarkably clear and simple photographs and drawings teach step-by-step all of the essential details necessary to an understanding of the arms. The text has been simplified in order to provide the novice as well as the expert with the key to an understanding of foreign as well as domestic small arms.

The author was employed by Armstrong Vickers, by the Secretariat of the League of Nations as an arms expert, and is at present Consultant on Military Weapons to the National Rifle Association. He has brought to his task a thorough firsthand knowledge of weapons and a deep concern lest we allow our arms to stagnate as we did after the last war. In this respect the *Author's Note* should be carefully read.

* * *

AUTOMATIC WEAPONS OF THE WORLD. By Melvin M. Johnson, Jr. and Charles T. Haven. William Morrow & Co. $7.50.

Automatic Weapons of the World, completed at the close of World War II, lists all the military automatic arms, new and old, from pistols up to 40mm automatic cannon, that were used by both the Axis and the United Nations. In addition it covers early and experimental automatic weapons of all types from 1885 to 1945, and sporting automatic rifles and shotguns and pocket pistols in use up to the present time.

Profusely illustrated, completely rewritten and expanded to almost double the size of the original book, *Automatic Arms,* this edition is an invaluable source of material on the automatic weapons of all nations.

* * *

THOROUGHBRED RACING AND BREEDING. Edited by Tom R. Underwood. Coward-McCann. $4.00.

This new book on the origins and development of racing is a welcome addition to the small selection of books on horsemanship now available. Particular emphasis is placed on the background, history, and contemporary state of breeding in this country.

Edited by Mr. Underwood, the book is the combined effort of some of the best known writers on the turf. The illustrations are excellent, the subject matter interesting, and the general format of the book reminiscent of prewar publications.

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By CHARLES G. BOLTE

As long as the world possesses practical
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BEACH RED. By Peter Bowman. Random House. $2.50.

This remarkable little volume, contrary to the publisher's blurb, *is* a war story—an hour in the life of a soldier from the time he climbs off a transport to land on a Pacific island, until he is killed in the jungle.

The form used is a loosely constructed blank verse which reads as prose but has a cadence that emphasizes the action described in an extraordinary fashion. The author's mastery of language is superb, and coupled with his perception produces a remarkable piece of literature.

Mr. Bowman not only has the ability to express human reactions, his observations of the animal and plant world surrounding him are equally keen and some of his best description is of the jungle and the sea. His adaptation of army orders and instructions to the half-bantering, half-bitter thoughts and words of the character is exceptionally skillful.

The book is not without its faults. There is occasional wordiness—probably the result of the novel style used—and a tendency to force epigrams and metaphors, but these weaknesses do not materially detract from the fact that this narrative is a brilliant piece of work by a young man whose literary career should be watched.

* * *

A RIBBON AND A STAR. By John Monks, Jr. and John Falter. Henry Holt & Co. $2.75.

ON TO WESTWARD. By Robert Sherrod. Duell, Sloan and Pearce. $3.00.

A Ribbon and A Star by the author of *Brother Rat* is the account of one small segment of a campaign. The material has been drawn from personal experience, and in spite of a tendency on the part of the author to dramatize his characters, moves with a swift clear realism. The illustrations by John Falter are excellent sketches done with a fine appreciation of the importance of good craftsmanship.

On to Westward recounts the story of the war in the Central Pacific as seen by the author of *Tarawa*. Mr. Sherrod is a balanced sure reporter, and his books on the war are materially enhanced by the fact that he does not attempt to cover too much territory, but confines his efforts to closely related accounts of small actions of which he has detailed knowledge.

Markedly different in style, both of these books bear the stamp of sincerity, and while not great, will contribute to the civilian's knowledge and understanding of war in the Pacific.

* * *

FIGHTING DIVISIONS. By CWO E. J. Kahn, Jr. and T/Sgt. Henry McLemore. Infantry Journal. $2.50.

It is difficult to weigh the value of this compilation of thumbnail sketches of the records of combat divisions in World War II. Limited to this war's exploits, the book is valueless as a history of the divisions, and the sketches are too concise to even give a full account of recent activities. As a 25¢ pocket pamphlet it might have a very slight reference value for refresher purposes but it does not warrant the fine format given it.

SOLDIER OF DEMOCRACY. By Kenneth S. Davis. Doubleday, Doran. $3.50.

Biographies of living men are generally written by two types of authors—those so enamoured of their subject that they are completely blind to his faults, or so bent on the destruction of a character that they will grant him no virtue. In his biography of General Eisenhower, Mr. Davis obviously falls into the first catagory. It would be illogical to expect a dispassionate and objective picture of a popular war hero at this time. Actually, Mr. Davis has done as good a job as could be expected. He has given the general public a great many personal facts that will help to make this dominant war figure more of a human being. But he has done his idol a disservice in making him too perfect, and in attempting to forestall any criticism of certain actions of questionable wisdom by tossing the blame into the air and allowing it to fall anywhere so long as it does not touch the General.

* * *

SOLDIER OF LIBERTY: Casimir Pulaski. By Clarence Manning. Philosophical Library. $3.00.

Casimir Pulaski, the first Chief of Cavalry in the Continental Army of the United States, was one of the many romantic foreign figures coloring the early pages of our history.

Unfortunately, the first two-thirds of what should have been a brilliant and scintillating biography of a gallant, headstrong, often irascible and stubborn man, sinks into a monotonous monologue on Polish intrigue. Unless the reader is well versed in the history and politics of 17th and 18th century Poland he will find it impossible to understand the balancing factors which build up to Pulaski's exile.

The last third of the volume is more interesting, because the reader is familiar with the names and circumstances mentioned. However, much of the material is reminiscent of Charles Francis Adams' *Studies Military and Diplomatic* in which a shorter but far more alive description of the great cavalryman during his service in the Continental Army appears.

* * *

LEGEND OF A MUSICAL CITY. By Max Graf. Philosophical Library. $3.00.

The author has enjoyed the intimate friendship of the musical stars of the last 50 years, and is imbued with the melody that echoes from house to house and from block to block in Vienna. He has drawn on this valuable background to describe the development of Viennese music through the interweaving of folk and religious themes, and the gradual absorption of neighboring contributions. He conducts the reader on a tour of the houses in which the musicians composed their work, the churches in which it was played and sung by choir members who were the greatest artists of their day, and the palaces and parks where the gay and pleasure-loving Viennese sang and danced.

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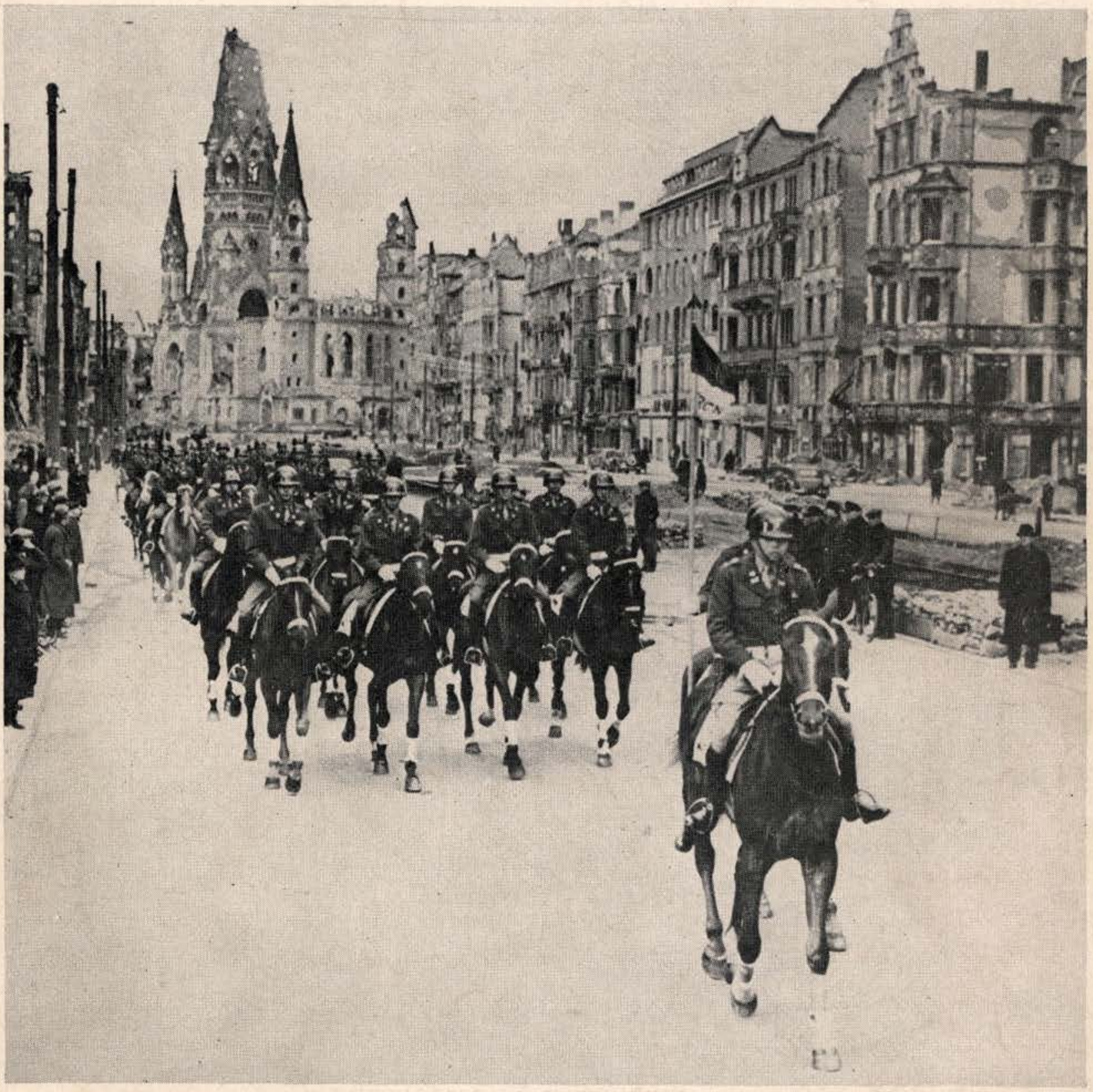

International News Photo

78th Cavalry Rcn. Troop members, mounted on some of Germany's finest horses, move up the Kurfurstendamm in Berlin recently as civilians watch. In the background is the shell of the Kurfurstendamm church.

MARCH-APRIL, 1946

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The Infantry-Tank Tea

In mutual support, members of the tank-infantry team are shown advancing as troops crouch low behind tank.

by Lieutenant Colonel

(This article was written in March, 1944, while the author was serving with the XIV Corps on Bougainville, Solomon Islands. It describes the methods of infantry-tank employment in jungle warfare which were developed in the XIV Corps by combined infantry-tank training and combat experience. Some of the tactics and expedients which are given are unorthodox, but the limitations imposed on tanks by jungle terrain required answers that were not in any book at that time. This article was not published in 1944 because of security restrictions. Recently these restrictions were removed and the article is now published because it clearly describes practical and realistic solutions to the problems of tank employment in jungle warfare. The success of the infantry-tank teams of the 37th and Americal Infantry Divisions and of the 754th Tank Battalion in their stubborn and prolonged defense of the Torokina Beachhead on Bougainville is ample proof of the soundness and value of the methods described in this article.—Editor's Note.)

Photos by Signal Corps

BY decisively defeating the Japanese in many local actions, infantry-tank teams proved their ability to operate in the jungle terrain of the Pacific Islands.

The following observations governing their employment are a result of training and combat experience based on careful consideration of the capabilities of tanks and the limitations imposed upon them by jungle terrain.

1. Tanks must be employed only over terrain suitable for tank movement and against definitely located enemy resistance.
2. Infantry-tank attacks in jungle terrain are normally for limited objectives only; therefore, the plans must include measures for rapid reorganization of all objectives.
3. The fire power of the tank assumes great importance in the jungle because of the limitations on maneuver and shock action. Therefore, whenever possible formations must have a maximum number of tanks in line to exploit their fire power.
4. To facilitate control, tank formations must be very simple. Wherever possible tanks must be carefully placed in attack formation behind the line of departure.
5. The infantry-tank attack requires maximum fire support by infantry and artillery weapons, both before and during the attack.
6. Advances must be by short bounds with frequent short halts for reorientation and reorganization.
7. Tanks must be employed in mass, not piecemeal, and in sufficient strength to insure continuity of effort.
8. Tanks and infantry must develop perfect teamwork: the tanks must provide accurate, direct fire against resistance holding up the infantry advance; the infantry must provide close-in security for tanks during their approach, attack, and withdrawal.
9. Constant communication between infantry and tank commanders must be maintained.
10. Maximum use must be made of bulldozers and engineer equipment to assist movement of tanks in jungle terrain.

FORMATIONS

The basic unit of the infantry-tank team is comprised of one platoon of tanks and one platoon of infantry to which are attached certain engineer specialists. The team operates in three echelons. First, an assault wave of three tanks; second, a support wave of two tanks, each of which is followed closely by an infantry squad with attached engineers; and third, the platoon reserve which contains one reserve tank and the remaining foot troops.

m in Jungle Operations

Wilbur C. Strand

Somewhere in the Pacific: Dead Japs attest the success of the infantry-tank team in combat in the jungles.

Around this basic unit, suitable company and battalion formations can be built up by employing infantry-tank teams in line, in column, or in echelon. In order to exploit the full fire power of the tanks, to maintain direction, and to prevent tanks from endangering each other by their own fire, whenever possible the team's advance should be made in line. Since combined operations of infantry and tanks in the jungle are inherently complicated, every effort must be made to keep formations as simple as possible.

Because of the extremely poor visibility in dense jungle undergrowth all distances and intervals must be greatly reduced, at times to as little as 5 or 10 yards.

COMMUNICATIONS

Constant and adequate communications are necessary within the tank and infantry units as well as between them. Many methods have been used to provide it, but best results have been obtained with the following:

Infantry company commander to infantry platoon leaders—by sound-powered telephone or runner.

Infantry company commander to tank officers—SCR 510, to SCR 508 in tanks.

Infantry platoon leader to infantry squad leader—SCR 536. A radio operator carries the radio and passes orders to the squad leader, who is thus free to direct operations of the tank and infantry under his immediate control. Runners are used if radio communication fails.

Infantry squad leader to tank commander—An EE8A telephone is placed inside the tank turret and a regulation flashlight is strapped in a position conspicuous to the tank commander. A 20-foot length of 4-strand electric cable is extended from the phone box inside the turret to the rear of the tank. At the end of the cable is attached an EE8A telephone handset. The butterfly switch on the handset is modified so that when pressed it will complete a circuit through one channel of the cable, and light the flashlight and attract the attention of the tank commander. Telephone conversation is then held over another channel of the cable. The use of the flashlight makes it possible for the infantry to signal the tank commander in spite of the noise of battle and the noise in the tank. The assistant squad leader carries the telephone handset and passes information from the infantry squad leader who directs the fire and movement of the tank.

Infantry platoon leader to tank platoon leader—The most satisfactory means of contact is an EE8A telephone combination. Another method is by SCR 536 to the reserve squad, thence by radio from the reserve tank to the tank platoon leader.

Engineer officers—The engineer officer is equipped with a SCR 593 (receiver) to keep abreast of the situation. He communicates with the Company CP by runner.

TARGET DESIGNATION

Tanks are almost blind in thick jungle and for that reason infantry squad leaders must designate to tank commanders obstacles to avoid and targets to fire on. Since enemy pillboxes and positions are extremely well camouflaged, target designation is difficult. Tracer fire for the designation of targets to tanks in the jungle is unsatisfactory. The use of colored smoke grenades proved most successful. It was found that fully charged grenades produce too much smoke and obscure the target. However, if the grenade fuze is unscrewed and half the charge removed an adequate amount of smoke is produced. To obtain a longer range, projection of the grenade from a rifle is desirable. The best results are obtained by arming the rifle grenade before firing since this produces a trail of smoke to the target.

ADVANCE PREPARATIONS

An early and thorough reconnaissance by infantry, tank, artillery, engineer, and communications officers is essential. Detailed reconnaissance is necessary in order that all commanders concerned may formulate a mutual plan of action.

A tank-infantry team protects organization of a newly won position; second man, left, talks to tank by phone.

Routes of approach—If suitable routes of approach for tanks do not exist, they must be prepared by the engineers.

Natural obstacles—The jungle contains many natural tank obstacles such as swamps, dense forest and undergrowth, precipitous slopes, coral or volcanic ridges, and numerous streams. Engineer troops must assist tanks by clearing trails and improvising bridges or crossings in swampy terrain. Medium tanks can operate through very thick undergrowth which contains small trees and matted vines, but they must detour around large trees, stumps, and fallen logs which are more than two feet high.

Minefields—It must be anticipated that the enemy will employ minefields and antitank guns to cover likely avenues of approach. Preliminary reconnaissance must be thorough to avoid the use of tanks over mined areas. If an attack is to be made over such an area, the mines must first be removed, either after the use of mine detection apparatus under cover of darkness or smoke and heavy protective fires, or by mortar or artillery fire, bangalore torpedoes, or prima cord.

Tank Park—It will be necessary to establish a tank park near the main supply routes. It should be protected from hostile artillery or mortar fire, if possible, and secure from enemy raiding parties. Dumps of fuel and ammunition should be established and facilities provided for the repair and maintenance of tanks and ordnance.

Reservicing Point—This point must be located conveniently near the zone of action. Normally two units of fire and one refill of fuel should be maintained at the reservicing point. Emergency maintenance crews also should be present.

Attack Position—This is an area close behind the front line where the tanks carefully deploy in their attack formation, and where the infantry and engineers take position in the formation, and final instructions are given. Here timely coördination with front line units must be effected and information on additional targets obtained. Normally not over 20 minutes should be spent in the attack position because excessive delay may warn the enemy of the impending action. Selected routes from the attack position to the line of departure must be reconnoitered in advance and marked with guides or tape.

Rally Point—The rally point may be the attack position, the reservicing point, or some other designated area. Plans must be made for emergency maintenance crews to meet the tanks at this position where, after an attack, the tanks are reorganized and reserviced. Casualties should be evacuated from this point and disabled tanks towed back to it.

Reserve Tanks—One tank company should not make more than two sorties during a day's action in the jungle. If action is to be longer, a reserve tank unit should relieve the original unit.

Supporting Fires—Prior to the attack, heavy concentrations of artillery fire are essential, but should be withheld until after reconnaissance has been completed. This will permit reconnaissance parties to operate with greater concealment, since artillery fire destroys jungle growth. After all reconnaissance has been completed and before the tanks leave the tank park, a heavy artillery concentration should be placed on the enemy positions. Shells must not be fuzed for tree bursts, because heavy limbs will be torn down and hinder the advance of the tanks. Bursts which demolish undergrowth are especially desirable, for enemy pillboxes are more easily spotted when shorn of screening vegetation. As the tanks approach the front lines, artillery fire should shift to the enemy rear but remain at maximum intensity so that the noise covers the sound of the approaching tanks. In general, infantry support weapons conduct fires by normal methods.

Conduct of the Attack

Advance—The infantry-tank team line moves forward at a slow rate. It is the duty of the tank company commander to keep the advancing tanks in line; and all commanders must be particularly careful to prevent tanks from firing on each other or on friendly troops. During counterattacks an infantry officer or NCO from the immediate front lines should ride in each assault tank and indicate to the tank commander the positions held by our troops and any known enemy.

The infantry-tank team in action—The team goes forward in three mutually supporting echelons or waves. The mission of the assault tanks, which advance slowly, firing cannon and machine guns at close range, is to gain fire superiority over the enemy, to force him into cover, and to clear out jungle growth so that enemy pillboxes may be seen. If a target is located, the tanks destroy it with cannon and machine gun fire.

In thick jungle, the two support tanks of the team advance along the tracks made by the two flank tanks of the assault wave. The mission of the support tanks is to knock out pillboxes and entrenched enemy which have been by-passed by the assault tanks, to cover the assault tanks, and by canister and machine gun fire prevent the enemy from approaching the tanks to disable them with mines or incendiaries. Support tanks designate targets to the assault tanks by radio-transmitted messages coördinated with smoke grenades thrown by the infantry. They also destroy snipers in trees with canister fired into tree tops, or with AP and HE fired into tree crotches.

The mission of the infantry squad in rear of each support tank is to locate enemy pillboxes and intrenchments and to designate these targets to the tanks by throwing or projecting colored smoke grenades onto them and by giving the appropriate directions to the tank commander. The squad also destroys by fire any enemy seen above ground, especially those who attempt to swarm over the tanks and damage them. In addition, it searches all holes and pillboxes which have been passed over and destroys the enemy therein with flame throwers, grenades, or explosive charges. Particular attention must be paid to enemy who feign death.

The mission of the team reserve is to repel enemy counterattacks; it also provides a reserve for replacing damaged tanks. Reserve tanks may be employed to knock out by-passed pillboxes or to fire on snipers. The enemy on the flanks may withhold fire until the assault tanks have passed and then deliver flanking fire on the infantry and the tanks. Infantry squad leaders, therefore, must make every effort to locate enemy positions and to direct the fire of the tanks toward them. To facilitate this, tanks and infantry should cease firing for short periods.

The infantry platoon leader must decide when to cease fire, and give the necessary orders. He must be well forward and in a position between his two advance squads to enable him to keep fully abreast of the situation at all times, and maintain adequate control. He must be accompanied by two or three riflemen who precede him for close-in protection, and a radio man to operate the SCR 536.

ORGANIZATION OF CAPTURED GROUND

When the objective is reached, the tanks halt and fire with all available weapons at definite targets or places of likely enemy approach or concealment. The infantry squads of the assault teams and the company support team should immediately push forward to the rear and flanks of the tank line and construct a hasty defensive position.

If the attack formation employs a company of tanks with a company of infantry (i.e., three infantry-tank teams in line or in echelon), a reserve reinforced company of infantry should follow up and construct the defensive position. The standard procedure of emplacing automatic weapons and mortars, or organizing the ground, digging in, and putting out protective wires should be used. Prepared concertinas for use in the defense may be carried into action on the rear decks of support tanks.

No guns should be emplaced or wire laid in the lanes made by the tanks as they advance in the attack. After the defensive position has been organized, the tanks and their protecting squads should withdraw over the original routes of advance. In turning about to withdraw, all tanks, if possible, should turn to the right about. Such a standardized procedure will enable the protecting squads to clear the danger space without confusion and subsequent loss of time. Before withdrawing, tanks must reverse their turrets and keep their guns trained in the direction of the enemy because enemy antitank guns silenced in the action may be remanned in time to fire on them as they withdraw. After the tanks have retired, the lanes are closed with concertina wire.

Special attention must be given to strengthening the flanks of the salient. To insure that no enemy are feigning death, the infantry must minutely investigate all ground within the salient and search all positions for personnel.

USE OF SCREENING SMOKE

Visibility in the jungle is so limited and observation so essential in the infantry-tank attack that the use of

Infantrymen mop up a position with rifles and grenades.

A light tank and supporting troops advance under fire.

screening smoke is not normal. If a minefield exists in the line of advance, however, smoke screens may be used to conceal the ground troops who remove the mines. Smoke should be used early enough to allow it to dissipate by the time the attack is launched. At the end of the attack, a smoke screen may be utilized to cover the withdrawal of the tanks and to mask from the enemy the digging in and wiring operations of the infantry as a defensive position is constructed.

Special Missions

Often tanks are employed individually or in small groups of two or three to reduce an isolated strong point which cannot be overcome by artillery or mortar fire, nor taken by infantry assault without undue cost. In such instances the enemy position must be located and a feasible route of approach to it reconnoitered. The tanks should move over the selected route to the position under close guard by a detail of infantry. The attack may be launched with a combination of infantry-tank tactics, or the position may be reduced by short-range direct fire by the tanks. Fire by canister and machine guns will frequently tear away undergrowth or camouflage and permit the gun ports of pillboxes to be seen. HE shells can then be fired into the openings. Tank-mounted flame-thrower fire may also be used effectively. Where no openings appear, AP shot will frequently make a breach in the pillbox through which HE can be fired.

At times enemy snipers armed with rifles or LMGs climb trees overlooking our lines and deliver plunging fire into our positions. Where they are too close to be dislodged by tree bursts of mortar shells, tanks are effective in dispersing or destroying them. Usually they are never definitely located. Canister and machine gun fire delivered into suspicious looking tree tops and AP shot fired through the boles of trees at suspected sniper perches will usually silence such enemy fire.

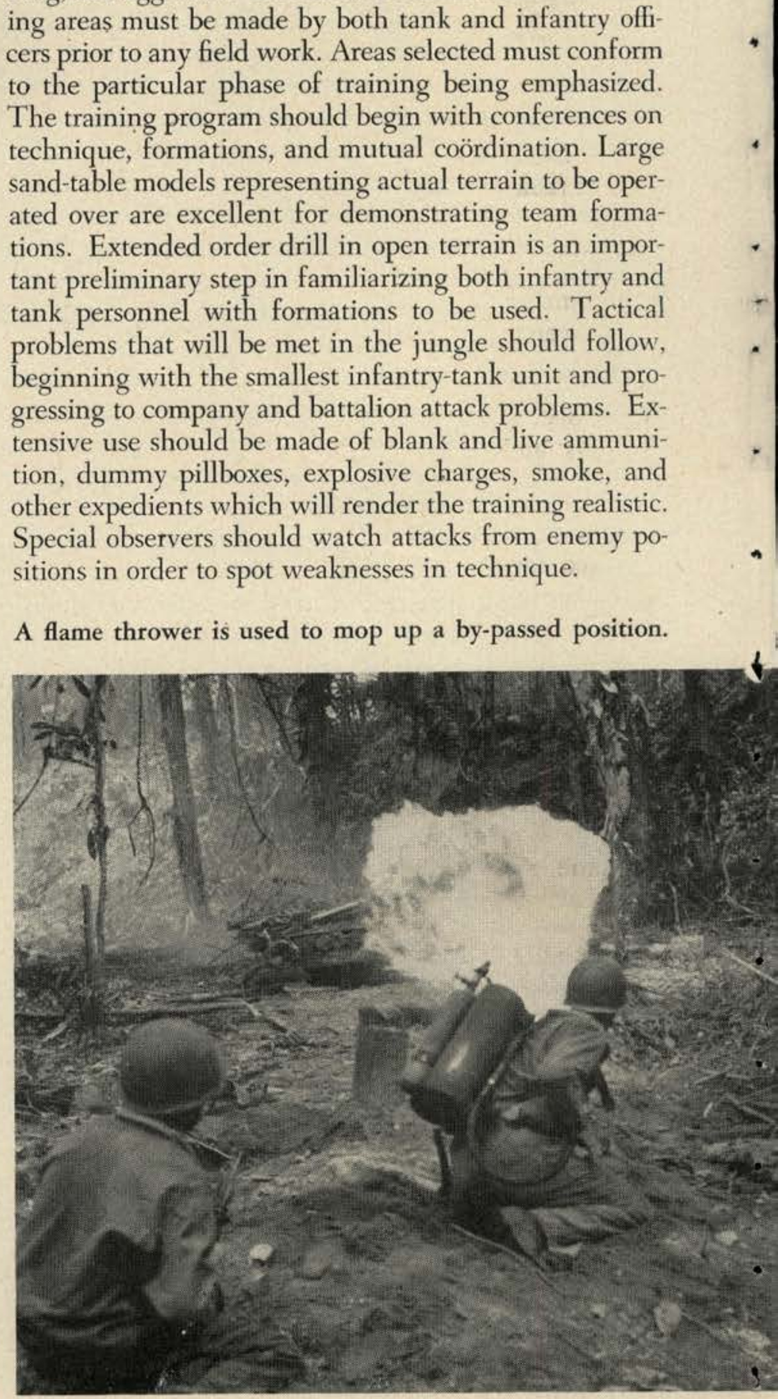
Single tanks are sometimes employed as mobile pillboxes to secure avenues of approach into our positions or to protect newly won vital installations until proper defenses can be organized. Tanks must always be protected by infantry when used for such purposes.

Small groups of tanks and infantry may be employed to make a feint on an enemy position in order to divert attention from another operation, such as the recovery of wounded.

Training the Infantry-Tank Team

The success of the infantry-tank team depends on intensive, thorough, combined training, sound planning, and aggressive execution. Reconnaissance of training areas must be made by both tank and infantry officers prior to any field work. Areas selected must conform to the particular phase of training being emphasized. The training program should begin with conferences on technique, formations, and mutual coördination. Large sand-table models representing actual terrain to be operated over are excellent for demonstrating team formations. Extended order drill in open terrain is an important preliminary step in familiarizing both infantry and tank personnel with formations to be used. Tactical problems that will be met in the jungle should follow, beginning with the smallest infantry-tank unit and progressing to company and battalion attack problems. Extensive use should be made of blank and live ammunition, dummy pillboxes, explosive charges, smoke, and other expedients which will render the training realistic. Special observers should watch attacks from enemy positions in order to spot weaknesses in technique.

A flame thrower is used to mop up a by-passed position.



Signal Corps Photo

Experienced troops on patrol in Luzon are shown taking full advantage of the terrain for concealment.

GARDEN

PATROLS IN THE JUNGLE

PART I

(The following article has been condensed from a Training Memorandum prepared by Headquarters I Corps. Although it is to be noted that some modifications are recommended for scouting and patrolling in the jungle, the basic principles outlined are almost identical with the instructions given in War Department training manuals, which have been SOP for years.—Editor's Note.)

UNDER the conditions that exist in jungle warfare, in which visibility usually is restricted and terrain tends to canalize activities, orthodox patrol formations often must be modified or abandoned entirely for new ones. Nevertheless, when all of a theater of operations is not jungle, the use of normal patrol formations should be utilized when conditions permit.

Basic Considerations

Patrols are employed for a number of missions, the most important of which are: to gather information (reconnaissance); to protect other troops (security); and to harass or raid the enemy (combat).

Other basic considerations which govern the operation of a jungle patrol are its size, the assembly points and objectives, maintenance of direction, chain of command, rate of march, and equipment.

To these should be added the general realization by the commander who sends it out that the patrol's mission must be simple and definite. A single patrol cannot execute involved missions efficiently. It is better to use a number of patrols, each with a single mission.

Size of Patrol—Generally depends upon: (1) The mission it is to perform. (2) The distance it will operate from friendly troops. (3) The length of time it will be out. (4) The number of messages it may be required to send back.

Combat missions ordinarily require stronger patrols than reconnaissance missions, although the latter may have to fight at times in order to obtain information. Patrols that operate at considerable distances from friendly troops must be stronger than those used for close-in work, because of greater danger from attacks and need for more equipment such as radios. The longer a patrol is away from its unit, the greater its requirements will be for messengers and equipment.

Patrols larger than a squad are harder to control and to conceal, tend to be more noisy, and usually make slower progress, but can send back messengers more frequently without loss of effectiveness.

When the area is reached where detailed reconnaissance is required, effective use of patrol personnel can be made by establishing a central base of operations and sending out a number of two or three man patrols from there. When time is short and a large area is to be investigated, this method is especially useful and the size of the patrol will be determined on this basis.

In general, use the least number of men to accomplish the mission, with due regard to safety, available time, and message requirements. For jungle operations no patrol should consist of less than three men. This number may be regarded as a basic *jungle scout team.*

Assembly Points, Objectives—Patrols should have a designated assembly point at which every member can reassemble in case of dispersal through ambush or surprise attack. Members of a dispersed patrol should endeavor to reach this point with all possible speed in order to facilitate resumption of the mission.

The patrol should progress from one designated objective to another. When the first has been reached, the patrol is halted and a new objective and assembly point named. New assembly points should be selected which afford concealment in the vicinity of the objective just reached. This will enable the patrol leader to point out the exact spot on the ground before the patrol proceeds to the next objective.

Maintenance of Direction—A patrol maintains direction when possible by marching on prominent terrain features. If there are none, compasses must be used. Each patrol must carry at least two, one for the leader, and one for the second-in-command in the rear, who guards against any deviation from the proper course. A qualified member of the patrol should serve as map man. He will know the patrol's location at all times and assist the leader to maintain the proper direction.

Rate of March—The leader must calculate in advance how fast he must move in order to accomplish the mission in the time allotted. The rate of movement will vary, depending on differences in terrain, proximity of the enemy, time of day, and the amount of detailed observation which is required. Patrol members should know each objective and the time required to reach it.

The rate of movement ordinarily necessary to complete the mission on time will not permit slow advances by creeping and crawling, or by successive short rushes by individuals. On terrain where good cover is available, however, but which is known to be under enemy observation, to avoid giving away the location of the patrol or sustaining losses, open spaces of 300 yards or less may be crossed by creeping and crawling. The same method of approach may be made when close to enemy positions, or to exposed observation points near the final objective. Except in combat, patrols do not advance by short rushes; time does not permit it. In crossing open ground the longer the patrol is exposed the more danger it is in. In general, reliance should be placed on the security groups while the patrol advances at the normal rate. When a patrol reaches the edge of an open space that cannot be avoided it should preferably be halted under cover while the point rapidly investigates the cover on the opposite side. Upon signal from the point that the cover ahead is not occupied, the patrol resumes its advance at the normal rate.

Equipment—A patrol should travel light to reduce fatigue but sufficient equipment must be carried to insure effective action. In the jungle, machetes are needed to cut trails, entrenching shovels are useful if combat develops. Compasses are invaluable for maintaining direction, and a pair of field glasses and a watch should be made available to the patrol under any terrain conditions. Rations are carried only on long missions and then in minimum amounts. Ammunition needs are anticipated and issue made accordingly. Personal equipment taken by patrol members must be checked to avoid carrying excess weight. Individuals must carry tablets for chlorination of drinking water if the patrol is to be out for more than 12 hours. A radio should be taken if the mission indicates its necessity.

CHARACTERISTICS OF PATROL FORMATIONS

Patrol formations are not hard and fast arrangements of personnel in the same manner as are squads in close-order drill. They are fluid and flexible, and permit the individual patrol members to take full advantage of cover and terrain. The formation in use by the patrol at any one moment should be naturally adapted to that particular piece of terrain. It should be developed by the patrol members on order from the leader, and based almost entirely upon their ability to see each other and at the same time make full use of cover and concealment. After deciding what formation will be used, the patrol leader conveys his decision to the patrol by signal, and members of the patrol change their relative positions to conform.

Within the designated formation, points and flank groups will move in and out as required in order to observe any cover up to 100 yards that might harbor an enemy. Their movement, however, must not be made in such a manner that it will prevent the inside man from maintaining visual contact with the patrol leader. In general, the lateral movement of flank groups will be limited to 100 yards from the line of advance.

The selection of suitable formations for different kinds of terrain, time and weather depends entirely upon the factor of visibility. When visibility is poor, contact between patrol members can be obtained in normal terrain by the use of the skirmish line, wedge or column formations. When it is good, contact between members is facilitated, and in normal terrain, the diamond, or line of half squad column formations are suitable. In jungle terrain at any time and in any weather, column formations are required.

Two things determine the leader's position:

1. If a clearly defined route can be prescribed in advance so that the leading scout can follow it, the patrol leader may be located anywhere within the patrol where his signals can be readily seen by individual members.
2. If the route cannot be definitely prescribed, the patrol leader must be in the leading group.

On well-defined trails loss of leaders will be reduced if they are located back of the point. When the route is not clearly defined, speed of movement will be slow unless the leader leads his patrol.

All members of a patrol should be regarded as potential "get-away men" and should understand that they are to return to headquarters only when ordered to do so by the leader, or when the patrol has been dispersed and no one else reaches the assembly point.

SECURITY

During movement as well as during the halt, provision must be taken for all-around security. Most formations provide for this, if members conduct themselves properly. While in motion, flank groups move in or out and investigate possible enemy positions adjacent to the route. On jungle trails, these flank groups may be unable to leave the track, but are nevertheless responsible for observation of their assigned flank. In normal terrain, any cover for an enemy up to 100 yards on the flanks must be observed by a movement of the flank groups to it.

A two-man flank group operates as follows: The man nearest the center of the patrol, while remaining within a maximum distance of 100 yards away, determines his position on the basis of visibility, since he must keep the patrol leader in sight at all times. The man farther out remains in sight of the inside man, but normally does not go more than 20 yards away.

While investigating a woods, the inside man moves along its outskirts while the outside man penetrates into it as far as possible without losing sight of the inside man. The two, however, should not be separated in most cases by more than 20 yards. When traversing a ridge the inside man stays on the side toward the patrol while the other man investigates the other side. In so doing, he maintains contact with the inside man, but avoids the skyline.

The rate of movement of the leading group must be slowed down at times to permit the flank groups to cover the greater distance they have to travel. In order that the entire patrol will not be endangered, the leading man of a point group rapidly moves forward as the patrol approaches a ridge line or thick cover that might harbor enemy troops, and he slows down and permits the remainder of the point to catch up on the down slopes where the cover is thin. Approaches to crests and dangerous areas are made as carefully as possible to avoid enemy detection. The rear group moves rapidly from point to point where observation is good while maintaining a maximum distance of about 100 yards from the center of the patrol. During their movements, front and rear scouts must not lose sight of the inside man of their group, who is in visual contact with the patrol leader. At least one man of all groups maintains a position from which the leader can be seen and his signals recognized. Individual members of a patrol adapt themselves to the requirements of terrain and visibility within these general limitations.

Should an important terrain feature be situated too far from the selected route of the patrol to permit investigation by a flank group, the leader should change the course of the entire patrol to cover it, particularly if it is of tactical value to the battalion or regiment. The entire patrol may traverse the feature or only the flank group, depending upon its size and importance. Such deviations from the selected route of a patrol are necessary maneuvers, and the patrol's actual route while maintaining its general direction will weave back and forth across its direct line of march, in accordance with the needs for flank observation and protection.

MARCH OUTPOSTS

Automatically, and without exception, when it halts in enemy territory a patrol must establish a march outpost. The arrangement should provide for all-around protection. The mechanism of establishment follows:

1. The point, flank groups and rear point first halt in place.
2. Each group moves forward, to the flank or to the rear, far enough to permit them to see over or around or into cover which might harbor enemy groups. In no case, however, should the distance exceed 100 yards from the center of the patrol and, in the jungle, it will not normally be more than 50 yards.
3. While one man remains where he can see the patrol leader, the other man or men in the point or flank group move not more than 25 yards farther out. Members of the patrol remain in observation during the halt and take their former positions when movement is resumed. During short pauses of a minute or less when the patrol has halted for observation the patrol members remain in place, but when a longer halt is indicated the march outpost should be set up at once without command. It should be remembered that in normal terrain, if the flank groups are doing their work properly, they should be already in approximately correct position for the march outpost. If in the jungle, they move to the flank to the usual limits based on visibility.

(Formations adapted to jungle terrain and to normal terrain will be described in an article to appear in the next issue of THE CAVALRY JOURNAL.)

Cavalry Reconnaissance

In the Solomon Islands

CARDED

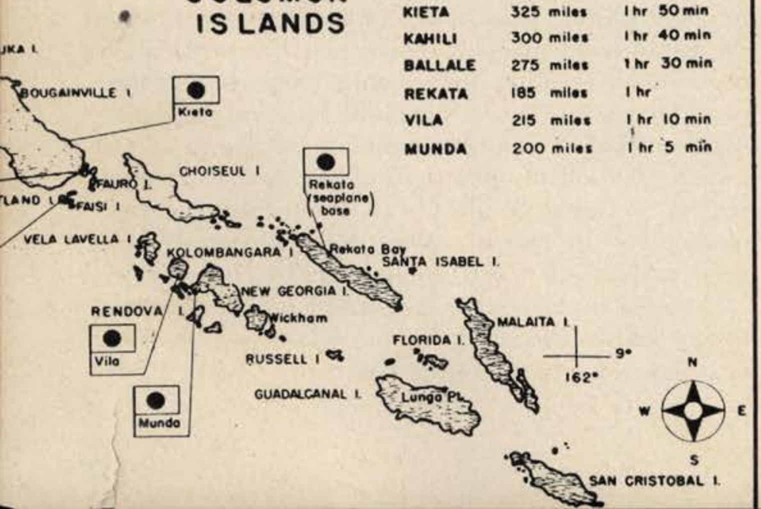
by Lieutenant Colonel E. C. D. Scherrer

During the New Georgia campaign the author, a Cavalry officer, Lt. Col. (then Captain) E. C. D. Scherrer, now an Instructor, Department of Tactics, The Cavalry School, was selected to direct and coördinate provisional reconnaissance patrols and the South Pacific Scouts. Lt. Col. Scherrer was awarded the Distinguished Service Cross and the Purple Heart with two Oak Leaf Clusters for his performance of duty in New Georgia.

AT dawn on June 30, 1943, in the South Pacific Theater of Operations, the third phase of the American offensive against the Japanese Imperial Forces began. The first and second phases had already been completed.

The first test of Japan's armed might began on August 7, 1942, when elements of the 1st Marine Division under command of Major General Vandegrift landed at Lunga Point on Guadalcanal Island on near-by Tulagi. From then until the end of the campaign on February 15, 1943, Guadalcanal was a vast rat hole down which were poured the lives of an estimated 42,500 Japanese soldiers, in a futile effort to prevent the American forces from gaining a foothold in the Solomon Islands.

The occupation of the Russell Islands, lying about 40 miles to the north and west of Guadalcanal, was carried out unopposed by the 43d Infantry Division in the early days of March, 1943. The second phase of the offensive was under way. Objective: complete local mastery of the air.



AIR DISTANCE AND FLYING TIME
JAP AIRBASES TO GUADALCANAL

KIETA	325 miles	1 hr 50 min
KAHILI	300 miles	1 hr 40 min
BALLALE	275 miles	1 hr 30 min
REKATA	185 miles	1 hr
VILA	215 miles	1 hr 10 min
MUNDA	200 miles	1 hr 5 min

Because of their strategic position between Guadalcanal and Japan's air bases to the north, the Russell Islands figured prominently in this plan. At those bases were bred and born frequent bombing missions intended to prevent consolidation of our Guadalcanal positions. Russells-based fighters frequently were able to break up enemy bomber formations headed for vital shipping in the thriving roadstead off Guadalcanal.

Japan's last mighty air blow at this target was delivered June 7, 1943. Of a force of 120 Nip dive and torpedo bombers and fighters, 94 were shot down. The action cost us six aircraft, from which two pilots were rescued. Damage to our shipping was slight. Never again did the Japs risk sending aircraft in numbers south of the Russells. They resorted to ineffective hit-and-run raids which did nothing but arouse the ire of the doughboys who had to stay awake and alert during all *condition red* periods. The Jap was to pay off for that loss of sleep in days to come.

The second phase was finished. Our mastery of the local air was complete.

The third phase was an offensive aimed at the heart of Japan's outer ring of island defenses at Rabaul, New Britain. The first step was of necessity the neutralization, occupation, and conversion to our own use of the enemy air bases at Munda, New Georgia, and Vila, Kolumbangara. With these bases in our hands, air cover could be provided for the acquisition of islands and the construction of additional bases even farther to the north. New Britain itself had to be hit.

Preliminary reconnaissance of New Georgia and surrounding small islands was carried out over a period of weeks extending from the end of the Guadalcanal campaign to the beginning of operations on Rendova Island, six miles from Munda, in the early dawn of June 30.

Available for the initial assault on Rendova Island, from which artillery support could be given operations on New Georgia, was a task force designated as "The New Georgia Occupation Force." It consisted of the 43d Infantry Division, the 37th Infantry Division, attached Marine units, and special units of both Army and Navy including naval construction battalions for the construction of airports. The 43d was located on the Russells and the 37th was on Guadalcanal where it had relieved the Americal Division on May 1.

The original plan of action directed that the 43d Division take Rendova Island (lying south of New Georgia) and adjacent small islands, to use as supply bases and staging areas to New Georgia proper. Simultaneous landings were to be made at Segi Island off the southern tip of New Georgia where an airfield was to be immediately constructed to render local fighter support. Jap positions at Rice Anchorage and Enogai Inlet on the northern shore of New Georgia were to be taken by the Marines plus attached infantry units from the 37th Division. These troops were then to establish a trail block south of Bairoko Harbor, also on the north shore, and east of Rice and Enogai. The trail block was to prevent supply and reinforcement of Jap forces around Munda on the south shore, since Bairoko was their port of entry into New Georgia.

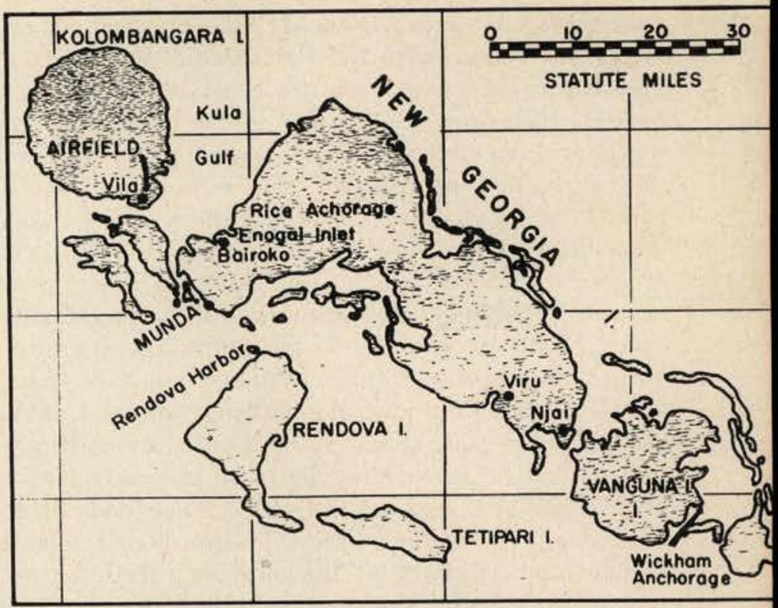
After taking Rendova, the 43d was to effect landings on New Georgia, destroy the enemy garrison, and capture the airfield. The 37th, except for units already attached to the Marines, was to be held in reserve and committed on call from Force.

In working out the reconnaissance plans it was found that there was no agency available within the division whose background and training qualified it for the particular type of jungle reconnaissance required. At that time the 43d Cavalry Reconnaissance Troop had not had the proper degree of training in jungle lore and woodcraft which is vital to the successful performance of reconnaissance missions in jungle areas.

It was decided to form eight reconnaissance patrols, each to consist of one officer, one NCO, and three men; to be carefully chosen from among the best men in the division.

The writer was made responsible for coördinating and controlling the eight reconnaissance patrols.

As D Day drew nearer, it was learned that a company of South Pacific Scouts would be attached to Force for duty on D Day plus three. The Scouts were native Fijians and Tongans commanded by New Zealand officers and NCO's. I had worked with them in the jungles of Fiji, spoke the Fijian language, and knew them to be unsurpassed as bush fighters and scouts. Having lived in the jungle for generations, their instinctive knowledge of jungle lore is far greater than the average white man can hope to attain, even with the most careful training.



The D Day plan directed that two companies of Barracudas land and secure a beachhead on Rendova Island at 0430. The Barracudas were an infantry battalion specially trained for such assignments. A combat team made up of infantry and attached artillery was to land at dawn on the Barracudas' beachhead and secure the island. The major task of the reconnaissance patrols was to begin that evening. Reinforced by two companies of infantry, they were to make the first landing on New Georgia. They were to secure a beachhead and carry out reconnaissance of trails and beach areas suitable for use by the main body.

On the morning of D Day, daylight came gradually with low, overhanging clouds and a misty rain. The tops of mountains on Rendova and neighboring islands poked their heads into gray, impenetrable fog, and ships a few hundred yards distant were only dark blobs on the water, until the muzzle-flashes of their preliminary bombardment threw them into sudden, sharp relief.

At 0630, the barges were swung over the side, and upon completion of their rendezvous circling and, on signal, headed for the beach. The men silently watched the shore line ahead. We were quickly soaked to the skin with spray and rain, but no one seemed to notice. One man nervously slipped the safety of his M1 on and off, his eyes never leaving the swiftly approaching shore. It was now 0635. No opposition was anticipated in landing because the two Barracuda companies had been put ashore as scheduled at 0430 and should have secured the beachhead.

As we drew closer inshore, we could make out the long, even rows of a cocoanut plantation with low undergrowth and bush scattered among the trees. Suddenly, the sound of firing was heard, curiously deadened by distance and water, but considering the splashes around the boats, it was obvious that we were the targets. The machine guns on the boats opened fire, hesitant at first, because of their fear that friendly troops might be somewhere on the beach ahead. The fire from shore increased. Where were the Barracudas? We had no idea, but it was apparent that the beach was still in the hands of the enemy. Our gunfire rose to a crescendo as the gunners got on the targets and poured lead into the low bushes and treetops. By the time we disembarked, the Japs had been driven off the beach. Patrols immediately fanned out to make contact. A short distance inland, the Japs waited. After about an hour of savage fighting, enemy resistance on the beachhead ended. The mystery of the Barracudas' failure to secure it was still unexplained. They were nowhere to be seen.

I went about my task of searching Jap dead, and made an interesting discovery which was to serve me well. I had heard that the Japanese possessed a distinctive odor, but had not placed too much stock in it until now. As I examined the still-warm bodies, sometimes within a minute of the time they died, I was convinced. Whether it was their clothing, their bodies, or the blood, I do not know, but there *was* a distinct, strong odor somewhat like that of a wild deer. Afterward, under favorable conditions, I was able to smell a Jap as far away as 50 yards.

The reconnaissance men secured little rest that day, due partly to anticipation of the coming night's work and partly to Nip dive bombers, which found the beachhead and inflicted considerable damage and casualties.

About 1100, the two companies of Barracudas, disgusted and weary, put in their appearance. In the darkness, they had been landed about three miles down the coast at another beach which they had taken and secured without seeing a Jap. With daylight, they perceived the mistake and proceeded up the coast to the cocoanut plantation where they were originally scheduled to land. The reconnaissance teams were to discover how easy it was to make such an error.

As darkness fell, the 46 men prepared to embark in Higgins boats along with one company of infantry. They were to pick up the other company on the way at another island, Baralulu, where they had landed that morning. The course to New Georgia lay through Oniavisa Passage to Baralulu Island and thence through Roviana Lagoon, which was studded with many small islands and submerged coral reefs. The waters were little known and the only available chart, which had been compiled from native information, was questionable at best. Their destination, Zanana Beach, was about 10 miles from Rendova, and the last two miles were unknown.

The trip from Rendova to Oniavisa Passage was uneventful. Speed was kept down in an effort to avoid damage by the deadly rocks, but several times the men caught their breath as coral scraped along the bottom of their boat. The craft slowed to minimum speed as it approached Baralulu. There was no sign of an infantry company. Nothing could be seen except the dark, forbidding tangle of jungle as the boats grated on the coral beach. Not a man made a sound. They listened for some sound of a friendly presence, but could hear nothing. The bow-door was let down. The first men leaped out on the beach and were followed by their comrades. Without warning, a blast of gunfire came from the jungle. The machine guns mounted on the boats replied immediately and raked the bush to provide cover for the men scrambling back into the boats. The motors roared as the boats pulled back off the beach and out of range. One man was dead and several wounded.

Since a landing at this point obviously was out of the question, it was decided to try at another spot farther down the shore. During the night, repeated attempts were made to get ashore on Baralulu and find the infantry company. Each was met by enemy fire or absolute quiet. Neither the infantry nor the native guide made an appearance. An order had been published to the effect that all water movements must be made under cover of darkness, so just before dawn, the landing party had to give it up and turn back. At daybreak, they landed at Rendova and turned the dead and wounded over to an aid station.

During the day, members of reconnaissance patrols "licked their wounds," reorganized, and planned to renew the attempt to land at Zanana that night. About 1000, word was received from the infantry company at Baralulu that the Japs had been driven off the beach and landings could be made without difficulty

That night, according to plan, the reconnaissance men embarked with the infantry to which another company had been added to form a battalion. The course was set for Zanana Beach, and the flotilla shoved off with all hands in high spirits. With inadequate charts and a native guide who was as lost as anyone else, it was impossible to maintain orientation with any degree of surety. There were dozens of small islands, each having the same appearance in the darkness, and hundreds of submerged coral reefs on which the boats were constantly becoming fouled.

Once, as they proceeded cautiously through the gloom, an illuminating flare suddenly popped overhead, throwing the boats and surrounding water into a ghastly white circle of radiance. Two planes circled overhead while everyone gritted their teeth and waited for the strafing or bombs they were sure were coming. The coxswains saved the day. They stopped their boats dead still to avoid showing propeller wakes. They were successful. The light presently died out, and the sound of the planes' engines faded away.

A short time later a white coral beach became visible ahead, curving away gently to the left. Everything was eerily silent except for the easy purr of the engines as they turned the propellers just fast enough to maintain steerage-way. That beach looked familiar to me. I knew I had seen it before somewhere, either physically, or on a map or aerial photo. I knew we could not land there.

As if in sudden agreement, the coxswain gave the throttle a shove. There was something unhealthy and forbidding about that dead white beach.

Dawn was approaching, and the mission was still fruitless. The flotilla commander announced his intention of starting back to Rendova in order to arrive there by daylight. But I requested that the reconnaissance patrols be put ashore at Baralulu instead of Rendova and that two boats be left for them to attempt a landing at Zanana in daylight. By this time, I was thoroughly convinced they would never reach Zanana except in daytime, and was greatly perturbed at the thought of searching for it in the darkness and consequently delaying the entire operation.

As we landed on Baralulu, I said to the coxswain, "Do you know that white beach where you were going to put us ashore awhile ago?"

The coxswain shook his head as if he thought he knew, but was not quite certain.

"Where was it?" he asked.

"That was Munda Point we nearly landed on. We were about a mile from the air-strip, and where we were sitting on the water is squarely in front of about a hundred Jap pillboxes with everything in 'em from caliber .25 machine guns to 77mm dual-purpose guns."

It was true. Native information and aerial photos disclosed that the Nips had heavily fortified Munda Point, evidently expecting attack from straight out to sea across Munda Bar. This belt of pillboxes was the reason for attempting to land at Zanana Beach. Zanana was to the east of the left flank of the Jap's positions facing the sea.

The problem of transportation to Zanana had to be solved as the boats returned to Rendova after we disembarked.

After dawn, the reconnaissance patrols scoured Baralulu for native canoes. A thorough search of the island failed to turn up the required transportation, and spirits settled to a low ebb. It seemed a dismal prospect with no assurance of success. The men had just settled down to wait for sunset, when a familiar sound reached them—the friendly purr of Higgins boats. Poking idly along inshore were two of them, apparently undecided as to whether or not to land. A few of the men showed themselves on the beach and hailed the boats.

The coxswains of the two craft were cautious individuals. They remained offshore, circling aimlessly while they carefully scanned the men on the beach. They evidently were suspicious of a Nip trap. Deciding the figures at the water's edge were indeed friendly GI's, they lost no time in getting ashore. Questioning brought forth the information that the two boat crews were thoroughly and completely lost. They admitted that friendly faces looked mighty good to them. The boats were loaded with engineer equipment with which to blast a landing and channel at Zanana. They had been dispatched upon the supposition that Zanana had been occupied by the reconnaissance patrol. Needless to say, when they discovered that no American troops were there they were happy not to have found the place.

The appearance of the two boats was a godsend. It was transportation, but the problem of securing it for our use still remained. The two coxswains were questioned as to the possibility of using the boats to transport our party to Zanana.

It was a deal. It could not disturb anyone's plans to unload the engineer equipment, since it could not be used until a beachhead was established at Zanana. So once more the reconnaissance patrols embarked, this time, in daylight (1115). They were 46 strong in addition to the boat crews, 40 men in the reconnaissance patrols, plus four radio operators with their SCR 284, and an aid man.

During the morning, while the canoe-hunt was in progress, we talked to a native who claimed to have been at Zanana. According to him, it was unoccupied, but was visited by a Jap patrol each morning at about the same time which, from his voluble description, seemed to be 1100. That meant that there probably would be no opposition on landing. Then, too, there would be sufficient time to prepare a welcome for the visiting patrol the next day.

The boats maneuvered slowly and carefully through a myriad of tiny islands and coral reefs for nearly two hours. Finally they reached the scanty, 50-yard stretch of beach for which they had searched so diligently but fruitlessly on those two previous nights. As the two craft stood in to shore, the men scanned the shore line intently, but could see nothing but jungle. Despite this, the men were uneasy, knowing too well that an army could be concealed in that thick bush. Their apprehension was groundless. The boats drove into the beach and the bow-doors dropped. Patrols fanned out silently and swiftly to front and flanks according to plan.

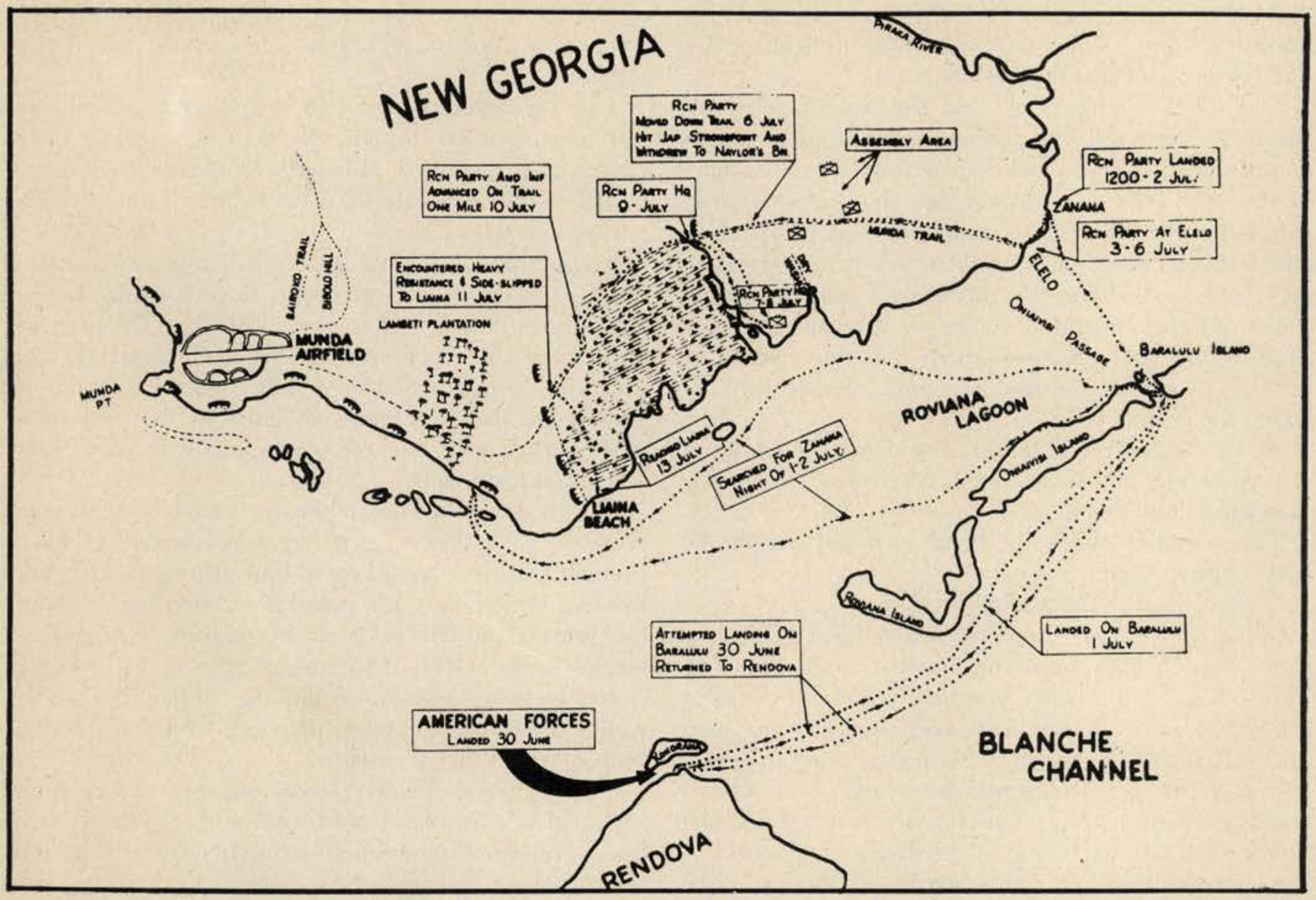
The first beachhead on the Jap stronghold of New Georgia had been established with 46 men!

The patrols, which had moved out immediately upon hitting the beach, reported the area clear of Japs within a 200-yard radius of the beachhead.

The mission was getting under way in earnest. According to the plan of action, the patrols were assigned a diversified task. Their initial job was to find landing beaches suitable for use of troops and equipment in strength. They were then to search for trails down which troops could advance toward Munda, find water sources, and seek out enemy strength, composition, and dispositions.

The first outfit to land was to move in on Zanana by battalions, and go into assembly areas off the beachhead in preparation for a push down Munda Trail to the airfield itself.

With only 50 yards of usable beach, Zanana was unsuitable for landings in force. Elelo, several hundred yards to the south, was a possible alternative, as was the mouth of the Piraka River to the north.


NEW GEORGIA
Piraka River
Rcn Party Moved Down Trail 6 July Hit Jap Strongpoint And Withdrew To Naylor's Bn
Assembly Area
Rcn Party Landed 1200 - 2 Jul.
Zanana
Rcn Party At Elelo 3-6 July
Rcn Party And Inf Advanced On Trail One Mile 10 July
Rcn Party Hq 9 - July
Munda Trail
Elelo
Encountered Heavy Resistance & Side-slipped To Liaina 11 July
Rcn Party Hq 7-8 July
Bairoko Trail
Bibolo Hill
Lambeti Plantation
Munda Airfield
Munda Pt
Onaiavisi Passage
Baralulu Island
Roviana Lagoon
Onaiavisi Island
Reached Liaina 13 July
Searched For Zanana Night Of 1-2 July
Liaina Beach
Roddana Island
Landed On Baraulu 1 July
Attempted Landing On Baraulu 30 June Returned To Rendova
American Forces Landed 30 June
Blanche Channel
Rendova

Since Force G-2 was extremely anxious to secure information on these landing sites, the first task was to dispatch patrols to obtain it. By native canoe, one patrol proceeded to the north along the coast to the mouth of the Piraka River, with orders to leave their canoes at that point and return to the beachhead overland. They were to search for trails, water sources, and potential assembly and dispersal areas to use in conjunction with the possible landing site at the river's mouth. Another patrol proceeded to Elelo by land with the same mission.

I was now getting anxious for the arrival of the native scouts. It was already apparent that the provisional reconnaissance patrols were handicapped by inadequate training in jungle reconnaissance. They had not acquired the knack of reading footprints and other signs, and could not possibly realize and interpret their full importance. However, it was extremely gratifying to see the enthusiasm with which they tackled their difficult job.

At 1600, the patrol from Elelo returned, with the information that there was a trail between Elelo and Munda, and that the Japs had left Elelo.

This was interesting information. The so-called Munda Trail was somewhere in the vicinity. It was known to be the main avenue of travel for the Japs along the south coast of the island. The trail discovered by the patrol at Elelo was apparently the Munda Trail, but it was different from that indicated on available maps. (Similar errors were to occur frequently.) It was necessary to maintain a constant check on maps and sketches and make the necessary corrections.

About 1700 that afternoon, the first of the infantry troops, a battalion, landed at Zanana Beach and dug in for the night. For everyone present, dusk to dawn constituted a nerve-racking, hair-raising experience. It was the battalion's first campaign and the men were green, jittery, and "trigger-happy." During that first night there was a small, intense war in progress. Our side did all the shooting. There wasn't a Jap in the vicinity. When daylight came, the men crawled from their holes, worn and haggard from a sleepless night. The score was four dead and eight wounded, all from friendly fire.

The first item in our business of the day which had to receive attention was the Jap patrol which was in the habit of visiting Zanana daily. We decided to turn the Jap's punctuality to advantage, and a patrol was sent down the trail as a reception committee. The patrol later reported that the Japs appeared on the trail at exactly the expected moment. They were strolling casually through the bush as if it were main street in Tokyo. Their carelessness was fatal. The patrol removed all papers from the bodies for translation by the G-2's language section.

In the meantime, the men not actually on patrol moved to Elelo, leaving guides to inform returning patrols as to the new base of operations. We had been at Elelo only a short time when the patrol which had gone to the Piraka River the previous afternoon reported in with valuable information. The Piraka seemed to open another avenue into the planned infantry assembly area.

Although information of the coast between the Piraka River and Elelo was now fairly complete, knowledge of trails in the interior and of enemy disposition and movement was scanty. The next move was to correct this deficiency. Reconnaissance teams were sent out with an over-all mission of covering the entire area between Elelo and Munda airfield. One patrol was sent directly to the airfield to secure all possible information of routes leading thereto, and of enemy strength, composition, and disposition on Munda Point. Another patrol started for Bairoko Trail, the supply trail leading from Mundo to Bairoko Harbor on the north side of the island. Their mission was to watch the trail and tabulate all movement to or from Munda. In that manner, a running account could be maintained as to what was added to or subtracted from the garrison there. Patrols also were assigned to terrain reconnaissance. Objective: trails toward Munda over which friendly infantry could advance; second mission, finding water sources. Water supply of troops was a constant problem and information of all sources was vital.

Finally an advance patrol of the South Pacific Scouts arrived and the task of reconnaissance could be performed with ease compared with the heartbreaking effort it required of the relatively untrained patrols.

The terrain reconnaissance was bearing fruit. Knowledge of the interior trails was constantly augmented by patrol reports. Frequent messages were sent to Force G-2 to enable him to make accurate changes on maps and sketches which often were in error.

The little force at Elelo was increased by the capture of their first prisoner of war, a gunner in an airplane which crashed in the water offshore. He obligingly swam to the beach where the men waited to receive him. The PW spoke a little English and, when convinced that no one had immediate intentions of killing him, interpreted the dog tags picked up in the vicinity the previous afternoon. His interpretation later was found to be accurate.

There was no PW enclosure available, and no means of evacuating the prisoner. He spent the night beside a New Zealand Sergeant, and made no effort to escape, apparently deciding that if any worrying was to be done, the Americans could do it. He went to sleep, and much to the disgust of the New Zealander, did not make a move which could possibly be interpreted as being lethal.

On July 5, the remainder of the Scouts came in, and plans were made to relieve the American patrols and return them to their original units. They had done their job well against severe handicaps, and had secured and passed on to Force a very considerable amount of information concerning trails, beaches, water sources, and terrain. It was anticipated that they would continue to perform patrol missions.

By this time, additional infantry units had landed, and were moving into their assembly areas preparatory to driving down the trail to Munda. One battalion had moved south toward the Barike River, and was in bivouac there. Another battalion was still at Zanana.

The next day the Scouts moved to the Munda Trail and prepared to reconnoiter it toward the airfield. It was to be the axis of advance for the infantry.

Landings up the coast from Munda undoubtedly had surprised the Japs. They recovered quickly, however, and were moving their forces to the north and northeast to meet the threat to their flank and rear. The Scouts found definite evidence of this as they moved down the trail toward Munda. Near the junction of the trail and the Barike River, the Japs opened up on us from a ridge with machine guns and rifles and pinned us down. Here I received my second wound of the campaign, a caliber .25 machine-gun bullet through the leg.

The enemy as usual was cleverly dug in and concealed, but the Scouts succeeded in nosing out a series of newly constructed emplacements and pillboxes. A message was immediately sent back to the infantry, and a company was sent up to knock out the strong point.

We had intended to sideslip to the south of the strong point and discover what lay to its flanks and rear. Jap patrols, however, were exceedingly active and numerous. With dusk approaching, it seemed unwise to attempt to pierce the screen before nightfall. Not wishing to spend the night ducking enemy patrols, the Scouts withdrew to the south and east along the Barike, made contact with a battalion in position to the north of the river with its left flank at the river's mouth, and spent the night in the comparative safety of the battalion perimeter.

Next morning, the Scouts moved up the river about a quarter mile to establish a base of operations. Supplies were running low. The wounded had to be evacuated by canoe down the river to the beach at Zanana from which they could be taken out by Higgins boat.

Through the media of patrol reports, a definite picture of enemy operations was beginning to form. The strong point on the Barike and the numerous enemy patrols constituted a screening force to delay the infantry's advance, while a MLR was being organized. Penetrating the screen, the Scouts located and reconnoitered the Nip's main positions one by one. Detailed information was promptly transmitted to Force.

Patrolling was becoming more difficult and dangerous each day. The enemy was thoroughly awakened to the situation, and it was almost impossible to move in the jungle without encountering Japs. All too frequently, patrols returned with a member missing and one or two wounded. They were proving their mettle in short, vicious skirmishes which characterize aggressive patrol action.

It finally required an entire infantry battalion two days of hard fighting to knock out the strong point which the Scouts had discovered the first day on the Trail. We moved back to the junction of the trail and the Barike and set up a base of operations.

The atmosphere was bristling. The jungle was a hornet's nest of Japs, moving day and night. Patrols watched and reported.

One patrol returned with information of Bairoko Trail. This byway had been the Scouts' bugaboo. It was known that a trail existed between Munda Airfield and Bairoko Harbor to the north. Patrols had repeatedly gone out to find it and report what traffic it carried, but without success. Persistence finally won out, the elusive trail was located and the usual corrections made on all maps. Indications were clear that the Japs were moving out of Munda to north and northeast.

The situation was ripe for a fight. An infantry regiment was in its assembly area, with one battalion on the left, another astride the Munda Trail, and a third in reserve.

Another battalion of infantry was assembled to the north of the trail. Since the action seemed destined to center on the Munda Trail, it was made the axis of patrol activity.

As the situation developed, a change was made in the administration of reconnaissance missions. The writer was relieved from direct command of the Scouts, and was attached as special staff officer to Hq of an Infantry regiment. The Scouts operated under a New Zealand officer, but as liaison officer for Force and Regimental Headquarters I still assigned their missions.

As contact became imminent, the regimental CO became increasingly apprehensive of his flanks and rear, especially the north flank. The south (left) flank, was anchored on a swamp which, at some points, extended slightly north of the trail itself. Any large movement through the bog was improbable as long as the north (right) flank offered comparatively favorable terrain.

On July 9, the Scouts' patrols were providing security for flanks and rear as well as probing at the airfield and the enemy flanks and rear. They also were kept busy orienting the various units as to their relative positions. With visibility often limited to a very few feet by the dense jungle, even a squad leader could only guess where the rear of his squad column or a flank of his skirmish line might be.

On the morning of July 10, the advance down Munda Trail began against light opposition. On the 11th, however, as the infantry approached the junction of the Munda Trail and a trail from Liaina Beach to the south, they encountered heavy resistance. The Japs were well dug in, and defending their positions with grim tenacity. It was immediately apparent that the infantry had hit a stone wall which it didn't possess the strength to breach. The Scouts brought in disturbing reports of the Japanese strength. Commanders had come to place implicit faith in those reports. Reinforcements were an absolute necessity, but getting them was quite another thing.

An Infantry regiment, less one battalion already committed, were coming in through the beaches at Zanana and Elelo. Those unsatisfactory landing sites could not handle more troops. Liaina Beach offered the best landing, but it was the right flank of the strong Jap positions which the doughboys were now battering. If that enemy anchor on the beach could be knocked out, it would mean that reinforcements would have an opportunity to land and strike on the enemy flank. It seemed worth the attempt.

It was decided that the infantry would sideslip to the left and move laterally along the face of the Jap line of resistance to Liaina and secure the beachhead.

The Scouts, doing magnificent work, often pointed out Jap guns and fields of fire into which the doughboys otherwise would have stumbled blindly. They simply could not see through the jungle foliage, and even after an enemy gun had exacted its toll, it was extremely difficult to locate and silence.

The gruelling pace was beginning to tell on the Scouts. Casualties were high and the natives were saddened by the accidental death of one of their officers, a favorite among them. He was killed while directing an artillery concentration on an enemy installation. To compensate for poor visibility, he deliberately crawled to within 30 yards of the target. He brought the fire too close. Despite lack of rest and adequate rations, the Scouts continued to outpatrol the Japs night and day. Nor did their own losses stop them. They were frequently inside Japanese bivouacs. One New Zealander himself spent one night in a foxhole with a Jap soldier. Both were seeking refuge from American artillery fire. The Jap, apparently mistaking the captain for one of his countrymen, grunted a greeting and moved over.

The Japs made their customary attempts at trickery and deception. One time I received a message from Force asking for additional data in support of my urgent request for artillery fire on a certain area. The request, radioed to Force, had been signed with my name, but had not originated with me.

Immediately I was able to advise Force of this attempt at deception by the Japs.

The Japs had requested fire on an American bivouac area.

On the morning of the 12th, I was with the leading battalion in the lateral movement to Liaina. The most direct route to the beach lay through the swamp; therefore, believing there would be little opposition in the swamp itself if they could reach it without interception, I recommended that they follow a compass course directly across it. The battalion was now west of the bulge in the swamp which projected to the north across the trail. Fear that the Japs might react quickly enough to hit the lateral movement on the flank was well founded.

That afternoon, shortly before the leading battalion reached the swamp's edge, the Japs struck immediately to the rear with a reinforced battalion and succeeded in cutting the American column in two. One battalion, the New Englanders (White Mountain Boys) apparently the Jap's focal point, was receiving intense machine-gun and mortar fire. The two rear battalions were relatively untouched.

Once again, patrol information provided the basis for a change of plan. The Scouts had determined that there was no other large enemy force in the area except the one pouring it on the New Englanders. If this battalion, almost on the edge of the swamp, could keep the Japs engaged, the other two battalions could by-pass to the east and proceed unimpeded across the marsh to the beach.

A message was sent to the other two battalions recommending this course of action, and Scouts to guide them through the swamp were arranged for. The recommendation was accepted. The White Mountain Boys settle down to fighting off the Nips who were inflicting casualties, but not making appreciable headway.

The scheme worked. The other two battalions moved through the swamp and tore the Jap flank off Liaina Beach, thus opening the way for further landings.

In the meantime, the White Mountain Boys dug in preparatory to spending the night of the 12th on the edge of the swamp. The following morning, they pushed into the swamp itself in an effort to disengage. That evening the battalion entered the regimental perimeter on Liaina Beach.

The following morning infantry arrived on the new beachhead. The initial phase of the New Georgia campaign was completed.

Lessons Learned

1. For jungle operations, reconnaissance personnel must have specialized training. It takes more than guts and enthusiasm for a man to hold up his end on a jungle patrol. He is not worth much without a solid backlog of jungle know-how. If a scout cannot "read sign," he cannot get his job done.

2. Current doctrine pertaining to scouting and patrolling is adequate and sound. It provides an excellent basis for further specialized training. As soon as sufficient information is available, commanders must not fail to conduct training particularized to the areas in which their units are likely to be employed. Training for jungle reconnaissance imposes stern responsibilities on a unit.

3. Since most jungle patrol engagements are meeting engagements, each patrol should be equipped with two or three automatic weapons of the submachine-gun type to deliver a high volume of fire in critical moments. Arming of the patrols on New Georgia presented no particular problem, since each man generally acquired from the wounded or dead that weapon for which he had a preference, or one with which he felt himself especially proficient. Reconnaissance patrols of the 43d Division were armed with M1 rifles and Thompson submachine guns, while the South Pacific Scouts had the caliber .38 Australian Owens gun, the equivalent of our tommy gun, plus an assortment of rifles including M1903, M1917, the M1, and the British .303 rifle.

4. Knives are indispensable. A satisfactory knife may be improvised from salvage metal such as an old vehicle spring, or a discarded file. It should be designed to open up Japs and jungle trails with equal facility.

5. Grenades are first-rate jungle patrol weapons. Scouts in New Georgia often used them to delay pursuit when surprised or ambushed. Scattering like a flushed covey of quail, members of the patrol fired their weapons and dropped grenades as they ran. They would reassemble at a previously designated rendezvous.

6. Patrol formations must be kept flexible because of the restrictions imposed by terrain and visibility. When it was practicable for the flankers to move off the axis of advance, the patrol generally would take up a loose diamond formation with the patrol leader initially in the center. More frequently, however, the patrol moved in a column with sectors of responsibility assigned to each man in order to attain a measure of all-around protection.

7. Patrol leaders have a hard row to hoe in maintaining control of their men. Often, a man cannot be seen standing three feet away. One man cannot control more than four others in heavy jungle without sacrificing speed and flexibility of movement. The use of small patrols helps solve the patrol leader's problem in this respect.

8. Generally speaking. the Jap is a lousy marksman, particularly on moving targets. Move fast and keep moving when fired upon. Fire may be received at such close ranges the opposition's strength may be ascertained by noting the sound of rifle bolts being opened and closed. Even at short range, few Jap riflemen or machine gunners can hit a man who does not give the grass a chance to grow under his feet.

9. The Jap stinks. Like a poisonous gas, he has a distinctive odor. Detection and recognition of it by a patrol member many times will prevent ambush.

10. Knowledge of the natives is essential to proper evaluation of information from native sources. My understanding of the people and the ability to speak the language enabled me to gain much information which otherwise would have been lost.

11. Too much cannot be said in favor of the natives who constitute the rank and file of the South Pacific Scouts. Simple and childlike, they nevertheless possess real courage and determination. In the execution of their tasks, they saved the lives of many American soldiers.

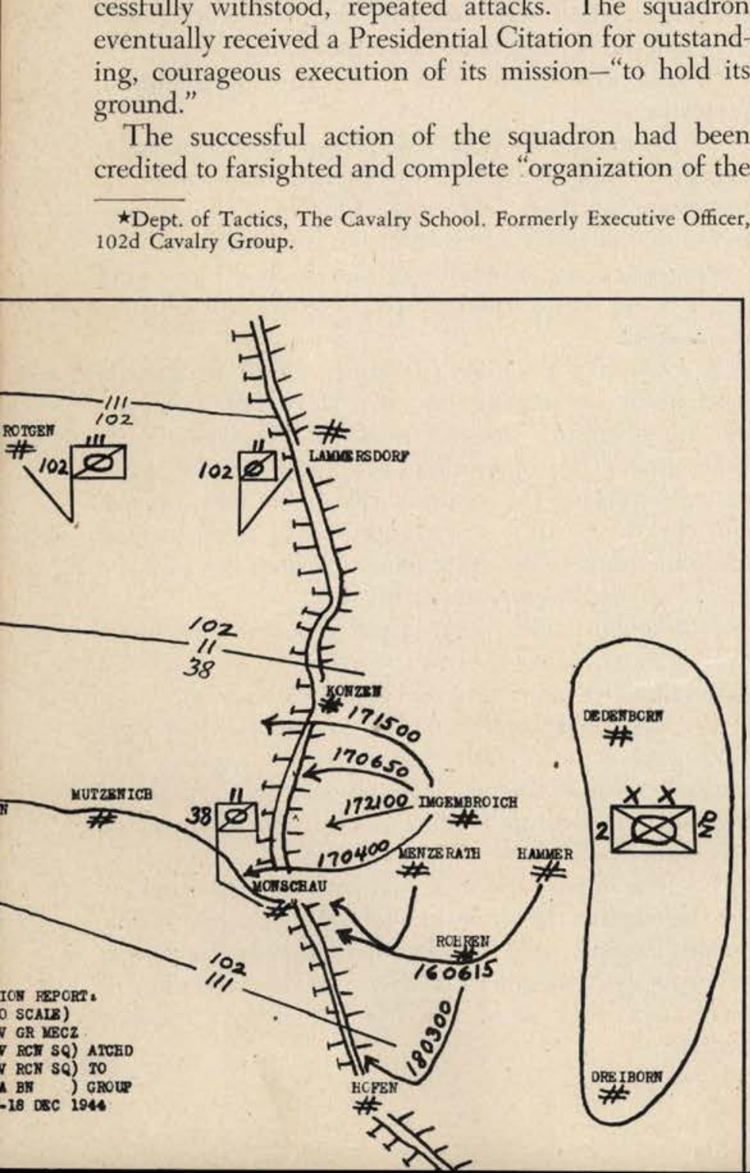
A CAVALRY MECHANIZED SQUADRON IN DEFENSE

by Lieutenant Colonel Paul L. Burke*

> **". . . The scattered cavalry outposts allowed the enemy to approach through these canalized routes until he was on their outer wire defenses. Then, at a given signal, all weapons opened up at point-blank range. In the light of 66mm mortar illuminating shells, the Germans were seen to be in headlong retreat back along the Rohren and Hammer roads."**

PRIOR to and during the period of the "Belgian Bulge," the 102d Cavalry Group held dismounted defensive positions on the northern shoulder of the break-through area. At the beginning of the German offensive the 38th Squadron was subjected to, and successfully withstood, repeated attacks. The squadron eventually received a Presidential Citation for outstanding, courageous execution of its mission—"to hold its ground."

The successful action of the squadron had been credited to farsighted and complete "organization of the ground for defense," as well as to the individual and collective heroism of its members.



For five weeks preceding the German attack the squadron, under Group supervision, worked tirelessly and ceaselessly to prepare its sector for defense. Fields of fire were cleared. Machine-gun positions were prepared and occupied. Mortars, organic assault guns, and the guns of attached self-propelled artillery battalions were registered in accordance with detailed defensive fire plans. Great quantities of antitank and antipersonnel mines were laid. Defensive concertina wire, well booby-trapped, was emplaced. An endless number of trip wires attached to flares and explosive charges were strung out. Listening and observation posts were established and maintained; and dismounted patrolling, both day and night, was continuous. How well these efforts were rewarded is indicated in the following paragraphs.

DEFENSE OF MONSCHAU SECTOR BY 38TH CAV RCN SQ

SPECIFIC DATA*: During December 16, 17 and 18, 1944, the Germans launched a full scale offensive in the Monschau sector in an effort to secure the Monschau-Eupen highway for future mechanized operations of the 2d Panzer Division, then assembled in the Dedenborn-Dreiborn area. The 38th Cavalry Reconnaissance Squadron (Mechanized), defending this sector with a strength of about 700 men and officers (less attachments), occupied a line on a front of over 9000 yards, from the town of Monschau (inclusive) to Lammersdorf (exclusive). All elements of the squadron, then on its 107th consecutive day of enemy contact, were employed facing the fortified positions of the Siegfried Line less than 1000 yards away. The 3d Platoon, Company "A," 112th Engineer (C) Battalion was attached to the squadron as well as liaison and forward observer parties from the 62d Field Artillery Battalion, then attached to the 102d Cavalry Group.

On December 13, 1944, the 2d Battalion, 16th Infantry Regiment, was withdrawn from supporting positions astride the Monschau-Eupen road and the squadron became the only unit in this sector between the German lines and V Corps Headquarters located in Eupen. During the period December 13-14-15, 1944, there was a marked increase in enemy activity. The attached engineer platoon was employed constantly, day and night, strengthening the squadron's defensive wire, mine and flare fields. The fire missions of Troop "E" (Assault Gun Troop) and of the 62d Armored Field Artillery Battalion increased about 30%. Additional listening posts were established well in front of the squadron line.

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*Extract from an informal historical report.

On the night of December 15-16, 1944, much enemy air activity was noted over the squadron area, accompanied by an unusual use of pyrotechnics. Reports of German paratroop landings began to filter down from higher headquarters, and all personnel waited the coming of daylight, on December 16, 1944, in a state of tense and alert expectancy.

December 16

On December 16, 1944, the enemy struck. During the three-day period which followed, the Germans made five desperate attempts to penetrate the squadron lines and secure the Monschau-Eupen highway. These attacks ranged from a frontal assault, in battalion strength, to combined frontal and enveloping attacks employing elements of two regiments (751st and 752d Regiment, 326th Volks Grenadier Division).

Early on the morning of December 16, 1944, the enemy preceded his attack by a 35-minute artillery, mortar and rocket barrage of unprecedented severity. It was an obvious and effective attempt to isolate the Monschau sector by fire; all telephone communications were destroyed and the main supply route denied by a series of time-on target concentrations, which were followed throughout the day by severe interdictory and harassing fires.

At 0615A the enemy attacked Monschau from the east in battalion strength, employing both battalion and regimental support weapons. The thinly spread tank and reconnaissance platoons met and repulsed this numerically superior force in complete darkness. On the southeast of the town, noncommissioned officers, of necessity commanding the defenses of these strategic approaches, displayed outstanding combat proficiency. The approach of a company of enemy infantry from Menzerath, Hammer and Rohren was detected only a few minutes before contact was established. Coolly, and with grim determination, the scattered cavalry outposts allowed the enemy to approach through these canalized routes until he was on their outer wire defenses. Then, at a given signal, all weapons opened up at point-blank range. In the light of 60mm mortar illuminating shells, the Germans were seen to be in headlong retreat back along the Rohren and Hammer roads.

Simultaneously with the above attack, a larger enemy force concentrated on the high ground east and northeast of Monschau, and deployed to attack from the dragon's teeth and the "snake road" leading from Imgenbroich. Here the enemy assaulting infantry was pinned down by machine-gun fire from squadron trench positions in this area until forward observers from the squadron assault-gun troop and the 62d Armored Field Artillery could adjust on the target. In this manner the German attack was broken up at ranges of from 200 to 600 yards. The enemy was unable to close with the lightly held line and the attack was repulsed. At 0745A, coming from the Menzerath Hill in stronger force, the enemy partially succeeded in driving a wedge up the bed of the Roer River and within the cavalry outpost. The force of this attack was broken largely by the fire of a machine gun dismounted from one of the tanks defending the draw, reinforced by tank fire.

For the balance of the day the Germans kept up strong patrolling and sniper action. The squadron employed artillery fire and aggressive patrol action to prevent and break up the assembly of enemy troops on the squadron front. Observation posts and outposts reported the filling of pillboxes by the Germans and all intelligence pointed toward another attack to come. Every effort was made to bolster the squadron's thinly spread defense and immediate reinforcement was requested from the 102d Cavalry Group. Company A, 146th Engineer (C) Battalion was attached and reported to the squadron commander at about 1700A December 16. Two engineer platoons were attached to troops in the line and a third dug in supporting positions on the high ground west of Monschau, in Squadron reserve.

Again, the night of December 16-17 was marked by unusual enemy air activity and the use of many varied types of pyrotechnics. Large, low flying enemy airplanes passed over all troops; flying from east to west and returning, some dropped flares and others carried wing lights. Patrols and listening posts were put out in greater numbers, and indications of enemy troop movement were reported during the night.

December 17

At 0400A, on December 17, a listening post just west of Menzerath detected a large body of enemy approaching from that town. In the darkness, the listening post was very nearly overrun and the personnel were forced to engage in a fire fight for their own self protection. Although faced with tremendous odds, they maintained their vantage point and by radio adjusted artillery fire which inflicted severe casualties, and forced the enemy to withdraw.

Two and one-half hours later the enemy again attacked, accompanied by a repetition of the previous day's preparation barrage. Initially, three battalions attacked on all troop fronts from Monschau to Konzen and, simultaneously, enemy paratroopers of Colonel Von der Heydte's German paratroop regiment became active in rear of the squadron lines. The main attack developed, in regimental strength, to the north of Monschau in an effort to gain the dominating Mutzenich Hill and sever the Monschau-Eupen highway. Other points on the squadron front were subjected to strong and well-organized assaults by forces ranging from company to battalion strength. Enemy small-arms fire became severe and all advances by the Germans were supported by direct as well as indirect artillery fires.

In successive waves, the numerically superior enemy drove against, among, and through the beleaguered cavalry positions.

The squadron's light tanks defending the northern approaches to Monschau met the first thrust of the German attack just before dawn. Gaining the element of surprise by virtue of their well-camouflaged positions, the tankers skilfully employed every available weapon and effectively turned back over a company of the enemy. Heavy casualties were inflicted and an early attempt to sever the corps MSR at this point was denied.

As the attacking German infantry pressed north of Mutzenich, they commenced to infiltrate among the small farms on the outskirts of the town. Outposts were partially cut off and subjected to flanking fire. Fighting in small groups, these men refused to give ground which would have further exposed their comrades. Strong points were established by as few as four men and tenaciously held out while one hard-pressed platoon, which had had its line penetrated, counterattacked to restore its positions. Armored cars were employed to attack the advancing enemy and the German wedges were effectively driven out.

At one point the Germans succeeded in crossing the main supply route, at the northern edge of Monschau, under heavy supporting fire and established a machine-gun position within the squadron defensive positions. As in the several other instances of this nature, the cavalrymen held their ground, and the enemy position was eliminated by four tank crewmen who flanked and charged the German machine gun with small arms and hand grenades.

Forward observers, both from the Squadron Assault Gun Troop and from supporting artillery units, were mainly instrumental in breaking up the formation of enemy support and reserve troops which followed the main effort of the attack. All of these forward observation parties were forced to engage in fire fights at one time or another, in order to maintain their positions and protect themselves and their equipment.

North of Mutzenich, where five reconnaissance platoons defended a front of 6000 yards, the Germans achieved a penetration in force. More than 65 of the attacking infantry gained the dense forest behind the cavalry positions, and elements of the German paratroops dropped the preceding night also engaged the desperately fighting platoons from the rear. Observation posts of the 62d Armored Field Artillery, 186th Field Artillery and the 955th Field Artillery Battalion were overrun by the advancing Germans. Despite these numerous and formidable enemy threats, all lines and positions were maintained with grim determination and existing gaps sealed by employment of the attached engineers. Later in the day, added reinforcements in the form of Company A, 47th Armored Infantry arrived and deployed in the heavily wooded area of the break-through to clean up all enemy resistance in this sector. These reinforcements later joined forces with the cavalry and assisted in strengthening their lines.

At the height of the enemy's main effort, and as German support battalions commenced to move up in the area north of Mutzenich and Monschau, all available personnel were turned out to provide last-ditch security. Rear echelon maintenance and supply sections were employed as command post security and prisoner of war guards. Soldiers being treated at the squadron aid station, adjacent to the command post, were directed to rejoin their units. All prisoner of war statements indicated that an armored attack by the 2d SS Panzer Division was to follow the infantry assault that same day and the squadron prepared to hold at all cost.

From 0650A to 1500A the fighting continued with tremendous odds being thrown against the cavalry front. Gradually the platoons gained local control and artillery observers were enabled to place accurate fire on German troop concentrations as well as on routes of approach and supply.

At 1500A the beaten enemy commenced to withdraw under the constant pressure of artillery, mortar, tank and machine-gun fire. Two hours later the reinforcing infantry troops (Company A, 47th Armored Infantry) who had been cleaning up in the woods west of the squadron, came through and were integrated among the platoons for the night. Ten medium tanks were also placed in support of the line. The squadron, still in its original positions, consolidated for the expected armored threat.

As darkness fell, listening posts were put out, and patrols sent into enemy territory. At 2100A the Germans struck again. A large enemy force was detected approaching Monschau from the vicinity of Imgenbroich and was immediately illuminated by flares and 60mm mortar illuminating shells. In the resulting light approximately 200 Germans were taken under fire by the squadron's forward observers, and by tanks and machine guns. The engagement lasted for approximately 45 minutes, after which the enemy withdrew again with severe losses. At 2230A listening posts reported the approach of large numbers of troops from the direction of Imgenbroich, and again heavy fire was placed on an estimated 100 of the enemy, under the light of the 60mm mortar illuminating shells. Many casualties were observed and the German attackers dispersed.

December 18

At 0300A, December 18, an intense enemy artillery and rocket barrage fell on the Monschau and Hofen areas, which preceded an attack on the 395th Infantry defending Hofen Hill just south of Monschau. An estimated reinforced German battalion, followed by tanks, attempted to envelop the Monschau area from the south in a third desperate maneuver to seize the Monschau-Eupen road. Right flank elements of the squadron south of Monschau and on the Hofen Hill were engaged by enemy direct artillery fire and infantry action. At 1000A, the Germans had achieved a penetration among the infantry's positions, and units adjacent to the cavalrymen were withdrawn to be used elsewhere in a counterattacking rôle. Simultaneously, the weakened left flank of the infantry was subjected to a frontal attack. Marshalling their scant forces, the cavalrymen filled the gap and assisted in repelling this attack by the coördination of all available weapons including artillery.

Despite the terrific pressure under which the squadron fought against a numerically superior enemy, all elements maintained complete control and communications throughout the three days operations. This communication involved the maintenance of over 50 miles of telephone wire, 65 telephones and six switchboards, for which no personnel are assigned or trained within a cavalry squadron. In addition there were 16 active radio nets, incorporating approximately 63 radio sets. As a result the squadron commander was enabled, at all times, to present a clear and comprehensive picture of the situation to the cavalry group commander, and to conduct a coördinated defense.

The successful defense of the wide sector entrusted to the 38th Cavalry Reconnaissance Squadron (Mechanized) was due to the spontaneous, intelligent and combat wise performance of a great number of small groups of men. With every platoon committed, without supports, and with only an engineer platoon in reserve, it was the heavy sense of responsibility and the combat skill of each man on the line which maintained the integrity of the position. In the performance of its mission over the period of December 16-18 the 38th Cavalry Squadron (Mechanized) displayed outstanding performance of duty in action against the enemy and achieved a brilliant success in stopping the full scale German offensive in the Monschau sector. The significance of this is best brought out by the statement of Major August Braunwarth, commanding the German 54th Werfer Regiment, who was captured on January 13, 1945, at Mont le Ban, to the effect that: "We failed because our right flank near Monschau ran its head against a wall" (First U. S. Army PWI Reports January 15, 1945).

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Ammunition Used in Europe[★]

The machine gun, cal. .30, threw more lead in Europe from D-Day to VE-Day than any of the other small arms used by the Ground Forces—392,088,000 rounds, according to Ordnance Department figures. Next was the M-1 rifle with 241,885,000 rounds. Surprisingly, the .45-cal. automatic pistol accounted for 97,369,000 rounds as against 11,310,000 fired by the BAR.

The Ordnance Department listed the ammunition expenditure as follows:

Carbine, Cal. .30	130,022,000
Rifle, U. S Cal. .30 M1903	56,164,000
Rifle, BAR Cal. .30 M1918A2	11,310,000
Rifle, U. S. Cal. .30 M1	241,885,000
Gun, Machine Cal. .30 Ground	392,088,000
Pistol, Auto. Cal. .45, M1911A1	97,369,000
Gun, Machine Cal. .50 BB Blex CB	105,619,000
Mortar 60mm M2 W/mount	4,881,196
Mortar 81mm M1 W/mount	6,324,249
Gun 37mm AA (Carr Mtr Mult Gun M 15A1	467,814
Gun, 37mm AT Wheeled	1,170,081
Gun, Auto. 40mm AA	1,153,156
Gun, 57mm M1 Wheeled	631,080
Gun, 75mm Tank	2,003,952
Carriage Motor 75mm Howitzer M8	1,604,617
Carriage Motor 76mm Gun AT M18	972,650
Carriage Motor 3-in. Gun M10	1,639,780
Gun, 90mm AA Mobile	1,022,141
Carriage, Motor 90mm Gun, M36	424,741
Howitzer, 105mm Field M2A1	16,808,080
Howitzer, 105mm M3 (Short Barrel)	1,972,349
Howitzer, 155mm M1 M1918	4,548,526
Gun, 155mm Field M1A1	1,395,224
Gun, 4.5-in. M1	694,234
Howitzer, 8-in. M1	484,523
Gun, 8-in. Field	41,652
Howitzer, 240mm M1	82,494
Fuses for separate Loading Ammunition	8,830,681
Launcher, Rocket AT 2.36-inch (Bazooka)	1,310,823
Rifle-Grenade, Total	1,817,757
Mines	1,856,234
Torpedo Bangalore	73,734
Hand Grenades, Total	4,853,888

[★] *Army and Navy Register.*

HARASSING

by Major Thomas J. Brett*

DURING the period of December 1, 1944, to March 31, 1945, many cavalry units were placed in static situations, relieving infantry divisions on the Roer, and later on the Rhine. Infantry missions gave the cavalry an opportunity to demonstrate its flexibility in assuming and efficiently completing another type of difficult mission. One of the outstanding features of the new assignment was its initiation of a harassing program on both the Roer and the Rhine.

The 36th Cavalry Reconnaissance Squadron had three German 75mm towed guns and one U. S. Sherman tank that, although disabled, could be pulled into position. This made 4 guns available. They were placed in position during the night and, with ammunition which had been gathered from various sources, began shelling the small enemy held towns across the river. Cavalrymen without artillery experience operated the guns with the simplest type of fire control. Their fire nevertheless greatly harassed the garrisons, CPs, and installations in the small towns, and at no time was German counterbattery fire received.

TANKS

During this stage of operations the Germans were very wary lest a tank attack be launched from the American sector. It took only the noise of tanks running down the road near the front to set the German artillery and entire defense into high activity. Before harassment runs were made by tanks it was necessary that careful coördination be made with all adjacent units and artillery; every man of our own troops had to be notified of the time that the tanks would move, and the exact route to be taken. A careful reconnaissance of the route also was made by the tank commander to spot shell holes, piles of debris, and to brief road blocks. The first and second run of the tanks was made buttoned up as the enemy was expected to heavily shell the critical road junctions at which he would be able to hear the tanks passing. The third run was made with the turrets open, because it was discovered that the enemy was always three to 10 minutes late in placing his artillery to intercept the tanks. These runs were always made at night to restrict enemy observation, and they were very effective as the enemy remained stirred up for hours after them and expended hundreds of rounds of ammunition.

Four .50 caliber machine guns or 4 water-cooled .30 caliber machine guns in battery were used in indirect fire against known enemy towns and installations to disrupt the routine of everyday procedure. This made the enemy miserable while resting, messing, and travelling to and from installations.

We learned of the exact locations of the enemy CPs, messes, stables for cart horses, motor pools, routes of relief, routes used by carts bringing up hot meals, and artillery positions. Through indirect fire method and observation of strike these known locations were continually harassed by three to 4 batteries of machine guns. Alternate and supplementary positions with adjoining trenches were essential. Ten men were used in each battery, two men per gun, an officer or NCO in charge, and an OP. All work on installation was done at night, but actual firing took place in the daylight, as it was learned that the enemy was very alert during hours of darkness but used the daytime to rest and mess. The results of this type of firing were verified when captured POWs related a story of a continual hail of bullets around the towns and routes that they were forced to use. Many German soldiers even went without their meals for 24 to 48 hours.

SILENCE

Another method of harassment was used by the entire XIII Corps during January, 1945, on the Roer. At certain times all guns of the corps and its supporting troops ceased firing for 31 hours with the exception of shots fired at infiltrating Germans or by Jerry himself. One can imagine the thoughts of the enemy during this silence, especially since he was expecting two or three rounds of artillery on his position for every round that he fired into the American sector.

At 0700, after 31 hours of silence, all guns including artillery, machine guns, mortars, and rifles, opened up on every known enemy position. A heavy smoke screen was placed on their OPs and for 20 minutes this mighty bombardment continued.

At 0720 all guns ceased firing and for us the show was over; but the enemy remained energetic through the rest of the day, firing salvo after salvo at nonremunerative targets. It was later learned that every individual Jerry was on the alert in a defensive position throughout the remainder of the day.

Combat patrols of from 4 to 40 men were organized. Each patrol was carefully planned and S-2s of the group and squadron supplied all available information. Members of the patrol were excused from any other duty to prepare and plan for their one mission. The subject of combat patrols has been well covered in previous articles, therefore the writer will not go into the details of their planning. A number of these combat patrols, which infiltrated through enemy lines, and harassed the enemy over a 10-day period kept the enemy front line troops critically "on edge" at all times.

LOUD SPEAKERS

The use of loud speakers for propaganda and harassing of the enemy should be carefully planned. Although the following plan was not used by the cavalry it was used by other units and should be included here. Before the actual use of the loud speaker the following information about the enemy must be obtained: pinpoint positions of enemy troops in line, and of each enemy emplacement; and the names of individuals manning those positions. In many cases this is possible by POW interrogation. Preferably a pillbox or well fortified position should be selected for the loud speaker. The broadcaster should say something like this (with embellishments, of course, in German): "We are giving you the opportunity to surrender. If you do not we are going to destroy you. We know your exact position and we know every man in that position. For instance: Corporal Willie, we know that you are in a pillbox, in a grove of trees near the big bend in the river. To prove it we are going to destroy you and your pillbox." All artillery in the sector will have been previously coördinated to fire on that one pinpointed target and will proceed to destroy the position and annihilate the enemy. On cessation of fire the propaganda should immediately continue: "Sergeant Hans, you are next. We are giving you 10 minutes to surrender. If you do not surrender by that time we will destroy your position and all of your men as we have just destroyed Corporal Willie's position." The announcer should then go ahead and warn other positions of their destruction if they refuse to surrender. The writer knows of the very effective use of this system in the Brittany campaign by the 66th Infantry Division. The use of loud speakers, however, to emphasize our power and numbers without such prior planning as described above, should be discouraged.

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*Executive Officer, 11th Cavalry Group.

ARTILLERY

In the harassing program, artillery was used at intervals throughout the day and night on critical road junctions, towns, routes of communication, and known OPs. Detailed schedules of fire for each gun and each target were initiated by the corps artillery and proved very effective. The use of artillery to lay a smoke screen just in front of the enemy lines at odd times not only aided in the harassment of the enemy but provided concealment for American forces when they crossed the river to attack.

PYROTECHNICS

Pyrotechnics were never used to full advantage by the cavalry in its sector. They can be used effectively; but again, as in any other program, must be carefully coördinated and planned.

White phosphorus flares were used extensively by units in the entire front line sector at all times during the hours of darkness to deny the enemy free movement in his own sector.

HIGH VELOCITY WEAPONS

When it was known that the enemy had a strongpoint in a pillbox or in a large, thick-walled building that could not be destroyed by normal artillery fire, towed tanks were brought up during the night to a prearranged and prepared position. At first light the weapon was boresighted on the enemy strongpoint and the crew fired the high velocity gun "rapid fire" for 5 to 10 minutes. The crew then scrambled to a prearranged basement or shelter, leaving the gun in its position, as the German artillery, both high explosive and time fire, soon begin arriving in quantity on the spot.

The result of this type of harassment is doubtful, although it caused consternation among the enemy who were sleeping or on duty in the strongpoint. It boosted the morale of the men in our own sector, who generally had a "hate" for any German strongpoint. The crews of the tank destroyers came away after having had the "time of their lives," and enjoyed the entire mission.

The same procedure was used across the Rhine during the hours of darkness, but in this instance we exploited the quadruple .50 caliber guns of the AAA. The enemy at the time was very alert to the landing of our patrols on their side of the Rhine, and when the patrols landed the entire enemy defensive sector would fire and expose their positions. At this time the quadruple .50's of the SP AAA, which had been driven up behind the dike during the early hours of darkness, were moved up to the edge of the dike. They opened up and grazed the opposite side of the river dike and road with concentrated bands of fire. Again it is not known whether this procedure materially aided the harassing program, but the morale value to our own troops and the good that it did the AAA to actually fire from front line positions was worth the effort.

SUMMARY

For the initiation of a harassing program, a definite purpose should be established. In this case, the Battle of the Bulge was being fought to the south. The line of American troops in the north was being held very thinly, as evidenced by a cavalry group being called upon to relieve an infantry division. It was the aim of the higher command to keep as many of the enemy troops on our front as possible, in order to prevent the German command from sending them to the south to reinforce the enemy in the bulge. Harassing not only held enemy troops on our front, but kept them in such a condition that they were able to inflict far fewer casualties when the crossing actually was made.

The harassment program was highly successful in concealing the direction of the main attack on the Rhine. The American forces were scheduled to cross at Wesel, but the harassment indicated that the crossing would be made just south of Düsseldorf. In order to reinforce his front where the harassing program was carried out, the enemy was forced to withdraw crack paratroops from the north where the Allied attack actually occurred.

Cavalry in River Crossings★

ABOUT a battalion of German infantry, supported by about eight artillery and mortar batteries, defended the line Hill 105.3—Hill 102.6 (see sketch).

Our cavalry division, after completing a 70-kilometer march, had assembled in the woods north of Dymarka by 1200. The division's mission was to force a crossing of the Dnieper in the Dymarka-Nedianchichi sector, and, by attacking north along the right bank, to establish and widen a bridgehead, thus securing the crossing of the corps.

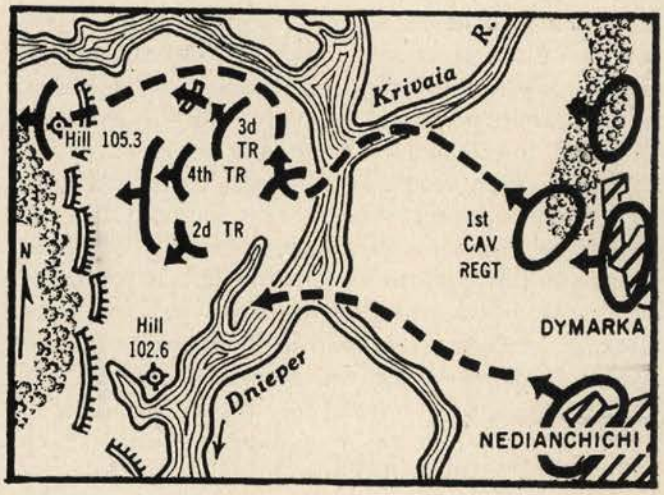
The right bank of the river with its low hills, swamps, and thick shrubbery enabled the enemy to maneuver his reserves in the depth of his defenses. The left bank, sloping in places, was also overgrown with shrubs. In the sector designated for the crossing, a small river, the Krivaia, joined the Dnieper. Because of this, it was possible to concentrate here a large number of crossing means. The irregular bank with numerous indentations was also overgrown with shrubs, and this facilitated the outfitting and preparation of troops.

The river was up to 800 meters wide, and its current was between one and a half and two meters per second. Thus, a raft with a load capacity for a squad would cross the river in about 40 or 50 minutes.

To capture a bridgehead on the opposite bank, the commander decided to use a strong advance force composed of a cavalry regiment and mortar and antiaircraft batteries. It was to be supported by the entire artillery. The bridgehead was to be established in the area east of Hill 105.3—Hill 102.6. The crossing was to be made west of Dymarka in the evening of the following day, and without artillery preparation. The artillery and heavy machine guns had to be made ready for night firing, which was to start on signal from the advance-force commander. The 4th Troop was to cross the river in one trip. It was charged with providing security for the crossing force, clearing the right bank of the enemy in the area of the crossing, and reconnoitering his defenses in depth.

This decision of the division commander was made in conformity with the situation. The Germans defended the river in considerable strength and had powerful fire support. Only a strong advance force could destroy the enemy's combat outposts, wedge into the main line of resistance, and capture and consolidate Hill 105.3, thus securing the crossing of the main forces of the division.

The regiment was to cross at night so that it could attack the enemy in darkness before dawn. This insured the secrecy and surprise of the action. For the same purpose, it was decided to do without artillery preparation. Artillery fire was to be employed only for the protection of the landing and the advance.



The division had 210 Iolshin bags [probably special inflatable bags for crossing operations.—Editor]. These were used to build 27 rafts with load capacities ranging from 300 to 1,300 kilograms. Thirty more rafts of similar capacity were built from crossing materials obtained locally. The rafts were supplied with ropes to be used for pulling them upstream on their return trips.

The crossing was very carefully organized. The paths leading to the crossing points were staked. The troops moved from the departure area in small groups along specially marked lanes, with road markers stationed all along the way. This secured their speedy and simultaneous arrival at the crossing point.

Two oarsmen were detailed to each raft, and one company-grade officer (sapper) was placed in charge of each 10-to-15-raft group. All raft and raft-group commanders were informed where to load the rafts and where to land on the other side. In order to avoid mixing the crossing units, various terrain features on the right bank of the river were used as reference points.

The troop started moving from its departure area when darkness set in. Marching in absolute silence, it reached its embarkation point southwest of the Krivaia River. By this time the sappers had prepared 17 rafts and nine boats. It took 20 minutes to load the troop. Each raft was accompanied by two sappers who were to bring the rafts back.

The rafts and the boats were now out in the river. Low visibility helped conceal them. In 45 minutes the troop had crossed the river and halted within 40 or 50 meters from the bank. The men jumped off and waded ashore. The German combat outposts were not prepared for the cavalrymen. In a brief engagement the enemy was almost completely annihilated. Having reached the southeastern slopes of Hill 105.3, the troop dug in and sent a signal to our side of the river.

At this time the German mortar batteries opened fire on the rafts and boats stuck on the shoals. Simultaneously, heavy machine-gun fire from Hill 102.6

★*Military Review*. Translated and digested at the Command and General Staff School from a Russian article by Colonel I. Baev in *Krasnaia Zvezda* (Red Star) July 3, 1945.

destroyed eight rafts and two boats. Our artillery, however, firing from the east bank, neutralized the enemy's mortars and machine guns.

The second troop with two mortar platoons started crossing over an hour and forty minutes later. This group used two small pontons, eight rafts made from Iolshin bags, and 12 rafts built of locally available materials. Upon reaching the shrub-covered area three kilometers northeast of Hill 102.6, the troop was counterattacked.

A strong wind slowed down the rafts on their return trip. The third trip, therefore, was delayed a little. This time it was the 3d Troop with a platoon of 45mm guns and one of 82mm mortars. The crossing equipment consisted of a raft made of two pontons, 12 small rafts (Iolshin bags), and seven boats and seven rafts built of local materials. The troop crossed the river and reached the shrub-covered area two kilometers northeast of Hill 105.3, where it was also counterattacked. This counterattack was supported by artillery and mortars, and by machine-gun fire coming from Hill 105.3. But with the support of our artillery firing from the left bank the troops repulsed the counterattack.

By dawn the whole regiment had crossed the Dnieper and had reached a nameless hill 500 meters east of Hill 105.3 and had dug in.

The 2d Regiment started crossing at 7 o'clock in the morning. The German mortar fire continued and was later augmented by aerial bombing. In spite of this the regiment reached the right bank, assaulted the enemy defending Hill 105.3, and soon captured it. During the night the regiment repulsed several German counterattacks. Meanwhile, the 3d Regiment's crossing was going on according to schedule.

Units of the adjacent infantry division crossed north of the cavalry. Both the divisions attacked and, repulsing counterattacks, succeeded in clearing a bridgehead 15 kilometers long and eight kilometers deep.

What lessons were learned in this crossing? First of all, it showed once more that it is possible for cavalry to cross a wide water barrier employing crossing means improvised from materials found in the vicinity of the crossing. It also proved that it is essential to become familiar beforehand with the nature of the water barrier, the surrounding terrain, and the character of the enemy's defenses.

All crossing requirements must be figured. When crossing materials are not available in sufficient quantity or cannot be delivered in time for the crossing operation, a scouting party is immediately organized to find such materials in the surrounding country.

The correct selection of the crossing point is very important, particularly when there is an insufficient number of supporting means and heavy artillery pieces or a shortage of ammunition. If this is the case, flanking and oblique fires from machine guns, mortars, and artillery are organized over the crossing front. These fires should prevent the enemy from counterattacking the units crossing the river. Stretches of the river bent in toward the attacker are most favorable for such fires.

When crossings of broad rivers are forced with the use of local materials only, the operation should be carried out at night with or without artillery preparation, depending on the situation. Night crossing without artillery preparation is possible only when the enemy's defenses are weak and when they are located far from the opposite bank. In all other cases, crossing at night or before dawn should be preceded by artillery preparation, and the crossing of the first echelon should be completed by dawn. This is done to enable the troops to engage the enemy during daylight.

If the enemy has been disorganized and has not had time enough to consolidate his positions, the river should be crossed immediately by the advance echelon, which will use organic and local crossing materials.

If the main line of resistance is far from the river and the latter is defended by combat outposts only, the crossing should be carried out at night. During the night, the outposts should be knocked out, the main body of the division crossed, and contact with the main line of resistance established. The assault should start at dawn after an artillery preparation.

In instances when the attacking troops have a considerable artillery superiority, it is to their advantage to start crossing the river before dawn so as to enable the first combat echelon to complete the crossing in darkness. The subsequent crossing and the development of the attack are made secure by the support of the artillery and air force.

The element of surprise is the most important factor in the success of river-crossing operations. This is achieved by secrecy of preparations and by demonstration action (dummy crossings). For the same purpose, it is recommended to cross over on a broad front and simultaneously from several points. Narrow-front crossing and the use of a single point for crossing are to be avoided by all means.

All enemy fire means near the river or flanking it should be neutralized by the time the crossing begins. It is also important to protect the crossing area by all available fire means, including antiaircraft artillery and airplanes. Once the crossing is begun, it must be continued with energy, persistence, and resoluteness. If the crossing is held up at one point, it must be shifted to the point where it is more successful. No crossing should be repeated where it has failed.

Cavalry horses, even well trained, cannot swim across a river which is 500 or more meters wide and has a medium current. In the above example only three horses out of the best five selected swam across.

* * * *

Amphibian Tank Battalion in Combat

by Lieutenant Colonel James L. Rogers[*]

Signal Corps Photo

Leaving their LSTs near Okinawa, "alligators" head for Ie Shima, a few thousand yards from the main island.

The Kwajalein Operation

ON its arrival at a camp 30 miles northeast of Honolulu in December, 1943 our amphibian tank battalion joined in the preparations that were being made for an assault landing. The battalion was attached to the 7th Infantry Division, then in training for an amphibious assault in the Central Pacific.

Less Company D, which had been attached to the 27th Infantry Division, the battalion bivouacked for two days near the camp, which at the time was so crowded with units in training that room was not immediately available.

The division's original plans had not called for the use of amphibian tractors, but reports from the Tarawa and Macon Islands campaign indicated that the assault troops should be transported ashore in them in order to insure the complete success of the operation. Few tractors, and no trained personnel were available, however, and so provisional tractor groups were formed from the three antitank companies of the division's three infantry regiments. Operation plans were made, and an intensive program was inaugurated, for there was little time for training before the coming operation.

Organization and Equipment

The formulated provisional amphibian tractor battalion consisted of 4 provisional tractor groups, one amphibian tank company, and a headquarters and headquarters detachment. Three of the provisional tractor groups were to be formed from the antitank companies, and one was to be made up of personnel from the battalion. Each group was composed of approximately 150 men and equipped with 34 tractors. The tank company was to have 17 tanks.

A tractor battalion en route to this area began to arrive, and with their vehicles made available, each company was equipped with 14 LVT A2s and 20 LVT 2s. The A2s were to make up the first, and a part of the second waves. A company, composed of two platoons of 17 tractors each, would be transported on two LSTs.

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[*] Commanding Officer.

Each platoon was broken down into two waves of 8 tractors each, leaving one extra tractor to serve for command or air-ground liaison. Each company then was composed of 4 waves of 8 tractors—each with two free additional tractors—and was set up to carry the assault troops of one battalion. The battalion was to be loaded on 9 LSTs, 8 of which would carry tractors, and one tanks.

The heterogeneous nature of this provisional battalion made it quite difficult to ready it for embarkation. But so little time was left that everyone concerned coöperated, and in 8 days the part of the unit that was to accompany us had completed training and was supplied with vehicles and equipment. The other provisional LVT groups also had been supplied.

A shortage of 500-series radios had created quite a problem in the communication plan. Originally each company command tractor and each platoon leader was to be equipped with an SCR-508, and each wave leader with an SCR-510 radio. Since the amphibian tanks already were equipped with Navy TCS-5 radios, however, it was planned to use them for tank company communication. Four SCR-510s finally turned up and were parcelled out to the tank company, which gave the company commander and each platoon leader one in addition to their TCS-5. It was necessary, however, to use the TCS-5 for intraplatoon communication.

The battalion was assigned 6 FM channels for use by battalion command and company, and one CW channel for the tank company platoons. Another channel, the LVT common, was later assigned personnel who had anything to do with the control and landing. This later proved the most useful channel in the operation and made it possible to talk to practically any person or unit. Communication during this operation was excellent, considering the limited time for radio installation. During the operation the commanding officer was constantly in contact with at least one or two radios in each company.

The built-in intercommunication system on the vehicles was not adequate because it was impossible to use army equipment with naval installations. It was necessary to completely re-wire the vehicles for army microphones and headsets. All electrical equipment was water-proofed and gave little or no trouble.

A number of modifications were made to the vehicles and equipment. Two .50 caliber machine guns were mounted on the cab rail, and shields were improvised for the protection of the gunners. Sandbags were also placed on top of the vehicle as added protection for the crews. A .30 caliber machine gun was mounted on each side of the vehicle. Flame throwers (which later became waterlogged and useless) were installed.

The crew of the LVT A2 was made up of 7 men, including a driver, an assistant driver, 4 machine gunners and a tractor commander. The LVT 2 crew was made up of three men—a driver, an assistant driver, and a vehicle commander. Since the weapons of the LVT 2s were not to be fired except at point targets and on direct orders from an officer, the infantrymen in the vehicles were to man the guns. The crew of the LVT A1 was composed of 7 men—a driver, an assistant driver, two scarf gunners, a 37mm gunner, a tank commander, and an extra man who would serve as an ammunition passer or a replacement for any crew member who became a casualty.

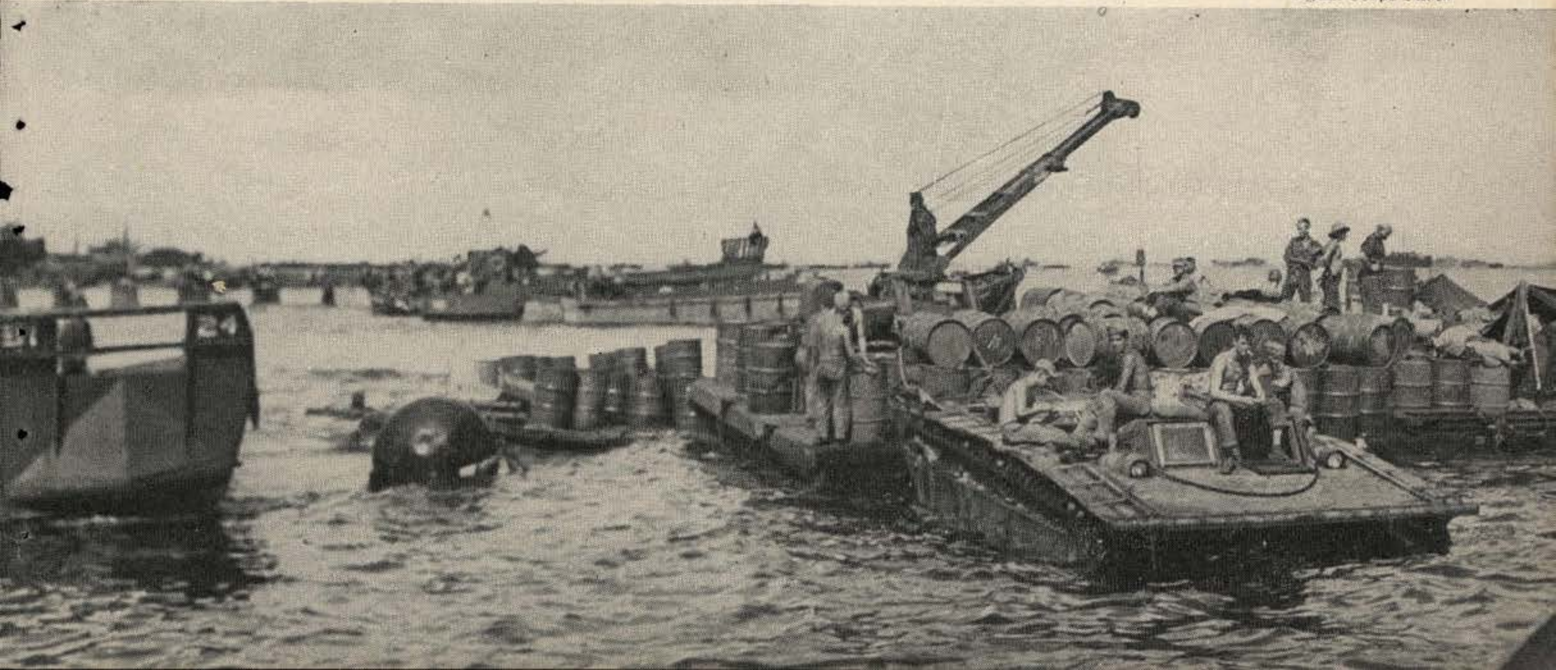
PRACTICE LANDINGS

Practice landings were carried out day and night as the provisional group rehearsed for the assault. The group carried the same infantry battalion it would in the actual operation. In the final training phase a series of landings were made with both single battalion and two battalions abreast. These landings were set up and carried out according to the D Day and D-plus-1 Day schedule. Firing was conducted in the final landing.

The first wave was to be made up of LVT A2s flanked by platoons of amphibian tanks echeloned to the right and left. If two assault battalions were used a

When coral reefs prohibited a closer approach at Guam, "alligators" were refueled 200 yards from the beach.

Signal Corps Photo



Signal Corps Photo

Amphibians move in on Morotai Island following its bombardment. Note smoke on shore from bursting shell.

wedge formation was to be employed. The force thus would obtain the fire power from all machine guns on the tractors as well as the 37mm and machine gun fire from the amphibian tanks. The tanks would also provide flank protection for the assault waves.

The provisional battalion issued all personal equipment and supplies for the initial assault landing. Division issued all other supplies. It was contemplated that the LVTs would return to the LSTs after each landing. Division therefore loaded emergency supplies on each LST so that tractors, tanks and crews could refit aboard the vessels. Four of the LSTs that carried tractors were stocked as floating supply dumps for assault troops who had gone ashore. On these LSTs two layers of ammunition were placed on the tank deck, and the tractors were carried on top of it.

Four of the 9 LSTs were to provide maintenance, and were equipped with second echelon tool sets plus all the spare parts obtainable. Personnel of the battalion maintenance platoon was divided among the 4 LSTs, each of which also carried two men from the attached ordnance department. In order to make available a motor park and a center for the rehabilitation of disabled vehicles the battalion also carried 21 replacement vehicles and crews on an LSD. Fifteen of these vehicles were LVT 2s and 6 were LVT A1s. The vehicles, crews, and the battalion rear command post were to be unloaded immediately.

FINAL REHEARSAL

Preparations continued for the final rehearsal. The Navy furnished a schedule for arrival of the LSTs off the loading area. After all beaches had been sounded and reconnoitered for coral reefs, it was decided to load two LSTs at a time at beaches 5 miles apart. Five were loaded and then bad weather damaged two and delayed loading the last four. The battalion proceeded to the rehearsal area, leaving the executive officer to bring up the 4 stranded vessels, which arrived in time.

The rehearsal consisted of a number of landings that duplicated the formation and tactics contemplated for the pending operation. These landings covered a three-day period and brought out many unforeseen mistakes which were soon corrected.

On the last landing the LVTs remained ashore for an 8-hour period of maintenance. By 2400 all vehicles were reloaded on the LSTs and were en route to Pearl Harbor. The assault troops, who were on the transports, continued to another island for firing exercises which included familiarization with overhead fire.

Upon the arrival of the LSTs in Pearl Harbor on the 15th all troops debarked and went to their permanent camps for rehabilitation. A small detachment was left aboard to complete maintenance and resupply all vehicles.

EN ROUTE TO TARGET

On January 19 the LSTs left for the target area. The transports followed on January 21.

En route to Kwajalein small details were ironed out. Numerous maps, aerial photographs and mosaics of the Kwajalein Atoll were available. Classes on orientation were conducted. The ship's radio kept all personnel informed on the results of the naval and air strikes which were taking place the final few days before D Day. Following each strike new intelligence information and aerial photographs were distributed to all command elements for further study. After the final important briefing of staffs, we arrived off Kwajalein on the morning of January 31.

Kwajalein Atoll, the central and most westerly of the Marshall Islands, consists of a series of flat coral islands all connected by underwater reefs. At its furthest points it is approximately 70 miles long and 30 miles wide. The atoll consists of two main islands: Roi in the northern sector, on which was situated the only airstrip, and Kwajalein in the southern sector. Kwajalein Island, largest of the group, is approximately one and one-half miles long and 1,500 yards wide at its furthest points.

The task force consisted of three main groups: the northern landing force, the southern landing force, and a floating reserve. Three strikes were to be made simultaneously: one by the Marines in the north sector of Kwajalein Atoll, one by the army in the south sector, and the third by one battalion of an infantry regiment against Majuro Atoll, located approximately 300 miles southeast of Kwajalein. (The occupation of Majuro was made unopposed. In fact, there were only two Japs on the island, all dressed, packed, and ready to surrender.)

In the southern sector, a division reconnaissance company was to have landed in rubber boats on two small islands that guarded the passage into the lagoon. The company landed too far to the north, and missed one of the islands, but the mistake soon was corrected. The landing was opposed by about 30 enemy troops.

The capture of Carlson Island was considered the key to the operation because on it 5 battalions of artillery were to be set up to support the landings on Kwajalein Island. It was hoped Carlson would soon be secured so that the Kwajalein assault could go in on D-plus-1. Plans for taking the remaining islands in the atoll would be dependent on the tactical situation after Kwajalein's capture. The operation against Carlson, and also Carlos Island, called for simultaneous landings on each by an infantry battalion which would be carried ashore by one LVT Group.

MECHANICS OF AN ASSAULT LANDING

The landing beach on Carlson Island had come under considerable prior attention. It had been accurately surveyed by submarines, aircraft and naval ships during the preliminary strikes, and azimuths had been taken to prominent objects ashore.

A reconnaissance of the beach had been made by a naval hydrographic party. During such work, usually carried out at low tide, and preferably at night, the area from the line of departure to the beach itself is cleared. All under-water obstacles, either natural or man-made, are removed or marked. Flags are used to mark boat lanes and all under-water objects which are not removed. Therefore, LVT personnel should be thoroughly acquainted with naval flag insignia.

In preparation for the strike against Carlson Island, the LSTs rendezvoused with the transports approximately 8 miles off Kwajalein Atoll. Here they took

"Alligators" are shown congesting the beach at Guam Island. Note edge of shell crater in near foreground.

Signal Corps Photo

aboard the troops who were to be carried ashore in their LVTs. At the same time, the control party was transferred to the senior control vessel, which then went to its position on the line of departure off the landing beach. By radar, the control ship placed itself in its exact position on the line of departure, which was 2,000 yards off shore, and the senior control boat took position on the left flank of this line. As a marker for the boat lane, which was approximately 600 yards wide, a sub-control craft (LCC) took its place on the right flank of the line of departure.

When the troops had been transferred to their proper LSTs, the vessels proceeded to their rendezvous area, which was about 1,000 yards in rear of the line of departure. Here the naval wave guide-officers met the waves carried by the LSTs and guided them to their assigned rendezvous area in rear of the line of departure. Each wave guide-boat flew a wave numeral flag, so that waves could be identified by the control personnel aboard the senior control craft.

The control party, carried by the senior control craft, usually consists of the senior naval control officer, responsible for the dispatching of the waves and all future traffic in and out of the beach; the assault troop commander, or his representative, who is vitally interested in the mechanics of the landing, which involves both his troops and their supplies; the unit supply officer, or his representative, who is responsible for the supplying of all assault troops ashore; and the LVT commander, or his representative, in command of the LVTs that are carrying the troops ashore. Here is a team that controls all phases of a landing operation, which are placed together to facilitate decisions on all landing problems. Each of these persons, as a rule, supplies his own communication equipment, but equipment aboard the control boat is available as a supplement.

From the line of departure, to which the waves had been guided, the LVTs were to be launched at a specific time. As H Hour approached the senior control officer raises the Number 1 Flag. This readies the first wave for departure. At the proper time, the 1 Flag is executed, or lowered, and the first wave moves across the line of departure. It is flanked on one side by its naval wave guide-boat, and on the other by the sub-control craft, which will guide the wave to the beach and go in close to the shore in order to obtain information on reef and general hydrographic conditions. The sub-control craft then returns to the flank of the boat lane, and out of range of small arms fire, where it sets up a rendezvous area for the tractors after they have unloaded ashore. This rendezvous area is used for the transhipment of troops from LCVPs to LVTs in the event the LCVPs are unable to land troop loads directly onto the beach. As subsequent assault waves are dispatched, they are guided in to the beach by their wave guide-boats, unload their troops or supplies, and then return to the rendezvous area. After completing their work, the naval wave guide crafts report back to the control boat and either are sent back to their mother ship or kept as tenders with the control boat.

LANDING GOES IN

In the landing on Carlson Island the first wave consisted of 8 LVT A2s flanked by two platoons of amphibian tanks. Its mission was to hit the beach, unload, and then move inland approximately 100 yards where it was to set up a perimeter defense for the protection of the landing of the assault troops. The subsequent waves of amphibian tractors were to land, unload their troops and return to the rendezvous area. When the troops had reorganized and tanks had been landed, the amphibian tractors and tanks were to be relieved and returned to the water.

As the action actually occurred, the lack of enemy resistance permitted the first wave to move rapidly inland to the appointed position. Here it waited until the infantry arrived and took over. It then pushed forward across the island to take one-third of it before finally setting up its defensive line. It then was relieved by land tanks and returned to the beach area. The landing on Carlos Island was carried out in the same manner, except that there were no amphibian tanks attached to that assault battalion.

In the landing on D Day, two LVT groups were used. Without vehicular casualties, they had carried the assault troops ashore, returned to the rendezvous area and transported other battalions in and had been reloaded on LSTs by 6 o'clock.

At 4 o'clock on the afternoon of D Day, 4 LVTs carried a naval hydrographic party on a reconnaissance of the proposed assault beaches off Kwajalein Island. These vehicles met light small-arms fire but returned without casualties.

By 6 o'clock that evening both Carlson and Carlos Islands had been completely secured, and the artillery had been set up and registered on Kwajalein Island. Approximately 120 enemy had been encountered.

On the afternoon of D Day, all replacement vehicles, crews, the ordnance detachment, and the executive officer with the rear CP were sent ashore on Carlos Island to establish a motor park.

THE KWAJALEIN LANDING

The following morning the Kwajalein assault took place. The assault troops consisted of two infantry regiments which landed abreast, each regiment in column of battalions. Four assault battalions were loaded in the 4 LVT groups. The first wave was furnished support by the tank company with a platoon echeloned on each flank, and a platoon, with company headquarters, in wedge formation between the two assault battalions. The landing was made on schedule under heavy small arms fire.

By 12 o'clock the tank company had been released and loaded. The tractor groups, having to tranship and carry ashore the reserve battalions, were not released till after dark. It was impossible for the LVTs to distinguish their proper LSTs, which caused many to be temporarily lost. A complete accounting was not obtained until the following morning. The remainder of this day was used for rehabilitation of men and vehicles. By 12 o'clock all LVTs had either been landed on Carlos Island or were loaded on LSTs just off shore. Vehicles needing major repairs were sent ashore on Carlos Island and replacements were sent out to the LSTs.

The assault on Burton Island was made on February 3 by two assault battalions of infantry which were transported by two LVT groups. During the action, a tank platoon captured two small adjoining islands. The following day one LVT group was divided and each half carried assault troops ashore on either Blenkenship or Burnett Islands. On February 5, three LVT groups each carried a battalion of infantry ashore on Berlin, Beverly or Bennett Islands. On the same day a fourth LVT group and two platoons of amphibian tanks were loaded on two LSTs carrying 11 tractors, 6 tanks and two companies of assault infantry. The mission of these two task forces was to proceed up each side of the lagoon and to land on and occupy the remaining islands in the southern sector of the atoll.

By February 6 all islands had been completely secured. The estimated enemy dead was 4,500. During the action, the provisional tractor battalion's losses were one man killed, and about 25 wounded and no permanent vehicular casualties.

A practice by which groups were kept at full strength and were always prepared for the next day's assault was to move all LSTs to the vicinity of Carlos Island at the end of each day's operations. At this point vehicles and personnel could be completely resupplied, and any vehicles needing major repairs could be sent ashore and replaced with replacement vehicles complete with new crews.

Upon completion of the operation, all vehicles were moved to Carlos Island, unloaded, and rehabilitated as well as possible with what material was at hand.

The Eniwetok Operation

At the conclusion of the Kwajalein operation our amphibian tank battalion (less one provisional LVT group, and all replacement vehicles and crews) was attached to a tactical group for the operation against Eniwetok, 300 miles to the northwest. All LVTs were assembled ashore and the vehicles in the best condition were selected. All others and their crews were to return to the Hawaiian Area.

The tactical group was a Marine headquarters provisionally set up to command the ground forces in the Eniwetok attack. The amphibian tractor battalion was to carry in assault troops in all scheduled landings.

As described in the preceding article, this battalion was a provisional one made up and trained for a specific mission, and using prescribed formations. The assault battalions of this task force had likewise been specifically trained, but used their own prescribed formations. These were put together, and based upon naval assault boat tactics. Personnel had little or no training with LVTs. It was finally decided to adopt new formations, and to carry out the assault missions as prescribed by the infantry assault battalions.

PREPARATIONS

This necessitated a reorganization of the battalion. The three provisional companies were reorganized into two, so that each company had a total of 51 LVTs, 28 LVT A2s and 23 LVT 2s. The tank company, which remained unchanged, was composed of 17 tanks. The battalion headquarters set-up was not changed.

The communication plan for this operation was about the same as for Kwajalein. A rear command post was set up on the command LST from which the executive officer could communicate with me as well as the LSTs, since each one was equipped with a 510 radio. These radios were to be used for communication while the battalion was loaded. My 510 was replaced with a 610 and one channel set up on the LST common channel.

The Kwajalein supply plan was followed, and an emergency load of rations, fuel, water, ammunition, etc. was placed on each LST so that it would provide a floating base. Supplies could be replenished from the dumps on Carlos Island.

The Kwajalein operation had ended February 6, and on the same day reassignment had been made to the tactical group for the Eniwetok assault. By February 9 all preparations had been completed—including rehabilitation, reorganization, and supply replenishment—and the battalion had been loaded. On February 11 the LSTs left Kwajalein, and on the 13th the transports sailed. D Day for Eniwetok was February 17, H Hour at 0830.

During the interim, the company commanders had talked to all personnel of the battalion and explained to them the capabilities and limitations of LVTs, the formations to be employed, and the tactical use of these vehicles. Complete sets of orders, maps and aerial photographs had been furnished each commander down to and including platoon leaders. The battalion had been briefed on the general situation as well as their own specific part in the operation.

The operation against Eniwetok had originally been scheduled for May, but an attack at this time appeared opportune for a number of reasons. The Kwajalein operation had progressed very smoothly and had not necessitated the commitment of the floating reserves. The naval reconnaissance had reported increased activity both from the airfield and on the atoll's defenses.

Enemy reinforcements also were reported being sent from the Marianas to strengthen the defense of their remaining atolls in the Marshalls. If Eniwetok was captured now while all was in readiness, preparations would not have to be made over again later. It also would be a greater surprise to the enemy, and, if it could be captured before reinforcements arrived, the job would be less costly in manpower.

Eniwetok Atoll is the westernmost atoll in the Marshall Group. It is oblong, approximately 35 miles long and 20 miles wide at its furthest points. There are three main islands, Anigebe, Eniwetok, and Perry, none of which are much more than a mile long and 1,000 yards wide. Intelligence reported approximately 3,000 enemy troops in the atoll.

Just after daylight the task force entered the two known passages on the lagoon side of the atoll. The LSTs, preceded by mine sweepers and escorted by destroyers and cruisers, entered the western passage and moved up the lagoon to a transport area about 5 miles off Anigebe Island. At approximately the same time, the transports, preceded by mine sweepers and escorted by destroyers, cruisers and battleships, entered the southern passage and continued to the transport area.

The plan of attack had been drawn up as follows: at H Hour on D Day an amphibian corps reconnaissance company was to land in LVTs on the small islands flanking Anigebe Island, on which artillery was to be emplaced to support the main landing. The capture of these islands also would keep the Japanese from infiltrating to the flanks and making counter-landings during the assault on Anigebe. No resistance was met, and by 1800 on February 17 the artillery was in position and registered on Anigebe Island about one and one-half miles away. On D-plus-one, two battalions of Marines were to land abreast on Anigebe with the mission of securing the airfield immediately, and the island as soon as possible.

On D-plus-X (it was hoped that X would be 2), the two battalions of an infantry regiment were to land simultaneously on Eniwetok Island and Perry Island. One battalion of Marines was to be alerted as a reserve for these two landings. This was as far as specific plans had been made, and the capture of the rest of the atoll was to be carried out as the tactical situation permitted.

Excellent air photographs of Eniwetok and Perry Islands showed that all ground installations had been destroyed. Since there was no visible sign of occupation, it was believed that possibly the two islands had been evacuated or were held by a relatively small enemy force. This proved to be incorrect. *(If properly used, nothing surpasses air photographs for orientation and interpretation of ground installations, but they should not be used as the last absolute evidence in planning a tactical assault. They show all exterior installations, but underground installations seldom can be seen.)*

On the atolls prior to Eniwetok, American troops had encountered enemy garrison forces consisting of naval personnel, falsely called Imperial Marines. Nowhere in Japanese T/Os have Imperial Marines been indicated as an organization. It is believed that such naval personnel were mainly base construction troops, and stranded sailors whose ships had been sunk. At Eniwetok an entirely new enemy was met—the army. It was the first time in the Central Pacific area that Japanese army troops had been encountered, and they fought with organized defenses and withdrawals, rather than with Banzai attacks that pitted swords and hand grenades against tanks.

The reconnaissance company landed unopposed on the islands adjoining Anigebe, and by dark on D Day the artillery had been landed and was registered in. All during that night naval gun fire pounded the defenders of Anigebe Island. At dawn on D-plus-one the reinforced marine regiment was ready for the assault.

Anigebe Island is 1,500 yards long and is shaped like a triangle. The Japanese found the island not quite long enough for an airstrip that would accommodate the larger types of planes, and to remedy this they had added a cement extension to the airstrip which they had built on the north edge of the island. This cement abutment extended out 100 yards into the lagoon, its top about 8 feet above the water. Along its sides pillboxes had been constructed to provide perfect fields of fire into the lagoon. The landings was to go in on this side of the island on a strip of beach 1,000 yards long, in the center of which was a pier.

The morning of D-plus-one was overcast, a strong wind was blowing and the current was moving at about 4 knots across our front. The control boats, whose duty it was to form the line, had been late in arriving, and when the LSTs came into position to launch the LVTs the line of departure had not yet been established. Consequently, by the time all LVTs had been launched they had drifted about 500 yards to the flank of the line of departure. Steps were taken immediately to move the LVTs to their correct position, and soon the first wave, followed by its successors, were en route towards the beach, flanked by their naval guide boats.

THE ASSAULT LANDING

For some time prior to the dispatch of the assault waves, destroyers, cruisers and battleships were busy pounding the beach area with everything from 20mm to 16-inch guns. The supporting artillery—a battalion of 105mm howitzers and one battalion of 75mm pack howitzers—also was laying down its barrage. Naval aircraft took part, hitting the beach area with 100 and 500 pound bombs and rockets.

Upon crossing the line of departure, the first wave was preceded by LCIs. These craft fired into the beach with 20- and 40mm rapid fire weapons and, when 1,000 yards off shore, launched their vast number of rockets, which swished in and exploded with devastating effect. The LCIs led the first wave toward the beach until forced to pull off to the flanks, from which point they continued to support the landing. Their move cleared the front ahead of the first wave which, when 500 yards from the shore, opened up with its large number of 37mm, .50 and .30 caliber machine guns. The succeeding waves fired when ordered by an officer, and then at only point targets.

The first wave continued to fire through the blanket of dust and dirt which covered the beach area. On the morning of February 17 this cloud of dust so obscured the island that it prevented the naval guide-officers from seeing their land marks ashore. This, coupled with the wind current, caused them to land about 300 yards north of their scheduled beaches. The result was that the assault battalion on the left flank landed at the end of the cement abutment from whose pillboxes a withering fire was sent into the troops as they climbed up on top of the flat airfield. The LVTs soon closed under the abutment, and reached a dead space out of the field of fire. It then was comparatively easy to neutralize the fortifications by hand grenades lobbed up into the pillboxes.

The amphibian tank platoon, coming in echeloned for a landing on the left flank, was forced to go in on the northern point of the island. It was a hot spot, but the platoon in a short time, and without supporting infantry, had neutralized and partially cleaned it out.

As at Kwajalein, the mission of the first wave of amtanks and amtracs was to push inland approximately 100 yards, unload their infantry, and with them set up a perimeter defense which would protect the landing of the remaining waves. After the land tanks came ashore and the infantry had reorganized preparatory to continuing the attack, the tractors composing the first wave were to return to the water rendezvous. The two flank amtank platoons, each supported by a company of the reserve battalion, were to pull off the flanks and protect them against enemy counterattacks. The center amtank platoon was to rendezvous on the beach, and the company commander was to report to the regimental CP ashore.

After landing, the mission of the two assault battalions was to push across the island as quickly as possible. The reserve battalion was to land when enough LVTs returned to the water rendezvous area to carry them ashore. The battalion, less two companies which were protecting the flanks, was to remain on the beach until called by the regimental commander when the tactical situation warranted.

The relationship of the infantrymen to the tractor crew is of utmost importance; for the infantryman, as well as everyone else, is experiencing fright while moving in on the assault. He is not only afraid of what he will find ashore, but even more afraid of the tractor in which he is riding. The tractor crews also are fearful of the work ahead but since they will unload the troops ashore and immediately return to their water rendezvous they have only half as much to fear. A tractor commander and crew, therefore, can do much to alleviate the infantryman's fears by making him realize that nothing outside of a direct hit can harm the vehicle.

Anigebe Island was secured by the Marines in 6 hours and 40 minutes. By 1700 the LSTs had re-loaded their LVTs, and were assembled in the transport area receiving the infantry regiment that was to take part in the next day's assault.

A complete enemy plan for the defense of Eniwetok Atoll had been captured on Anigebe Island. It showed that Eniwetok and Perry Islands were strong points in the defense of the atoll and were occupied by from 1,000 to 1,500 troops. It was decided, therefore, to send against it two infantry battalions in column of battalions, and to alert a Marine battalion as a reserve. The assault on Perry Island was postponed until after the capture of Eniwetok.

Little attention had been given Eniwetok because air photographs had shown its installations destroyed. An hour before the assault an intense naval and air attack was made. This failed to destroy the trees and vegetation, which provided cover from which the enemy sent heavy small arms fire against the assault troops. In contradiction to the air photographs, a cliff from 6 to 10 feet high was found about 10 yards from the water's edge. Tractors and tanks were held up until reconnaissance parties located openings through which the vehicles advanced across the island proper to carry out their normal mission. Intense opposition was encountered, however, and two days were required to secure the island.

On February 21, after a day for rehabilitation and reorganization, the assault was made on Perry Island, the last enemy stronghold in the atoll. It was captured the following day.

Of the estimated 4,500 Japanese on Eniwetok Atoll, all were killed but the few that surrendered. The battalion's only vehicular casualty in either the Kwajalein or Eniwetok operations occurred at Perry Island, when a tractor which had just transported casualties to a transport, was hit with shrapnel. Its engine cut out and it sank.

On February 23 the battalion was released from the tactical group and ordered to load on LSTs for the return trip to the Hawaiian Area.

The Marianas Operation

Approximately a month after our return to the Hawaiian Area from the Kwajalein and Eniwetok operations, a three-month training schedule was begun with the firing of individual and vehicular arms. The schedule next called for platoon and company training on land and water, and was to end with a series of battalion exercises and combat firing. Mistakes noted in combat were to be emphasized.

The camp provided limited facilities and it was necessary to construct many of our own ranges. A minimum of time was to be spent firing at known distances—a maximum amount on combat courses.

Combat had shown the need for a vehicular combat course, especially for training the scarf gunners. A crude but effective course was constructed: a trench was dug about 25 yards long and 12 feet deep. Prone, standing, and kneeling silhouette targets were nailed to long poles, and volunteers carried them back and forth in the ditch, which caused them to bob and change position rapidly. Firing first was from stationary vehicles at ranges of 50 and 100 yards; the vehicles then moved slowly from the 100 yard to the 50 yard point, firing as they approached. The scarf gunners also fired a few rounds at stationary targets, and strange to say, got fewer hits on them than on the bobbing targets.

On the return from the combat zone all tractors were turned in to ordnance for rebuilding. In order to further familiarize crews with their vehicles 30 amphibian tanks were retained. Among other training, the crews—helped by maintenance personnel—tore down these amphibian tanks. Then, starting with a hull, they completely rebuilt them, cleaned them up, worked over the parts and substituted new ones where necessary. Parts that had failed during combat were given a particular scrutiny and many corrective experiments were tried. The men preferred these vehicles for the next combat to the new ones which were received for it.

On April 20, 1944, the battalion was assigned to an amphibian corps for operational control, and attached to a Marine division. Assigned to the division for the coming operation were three amphibian tractor and one amphibian tank battalions. Our battalion was to constitute the first assault wave and land in a line formation with 4 companies abreast. Each company was to have 18 amphibian tanks, making a total of 72 in the battalion. Each of three LSTs was to carry an assault company, and the fourth the battalion headquarters company. The tractors which were to transport the troops ashore were to be carried on the LSTs and one amphibian tank platoon was to be carried with each assault company. The two company headquarters tanks, and a battalion tractor were to go on the assault battalion's headquarters LST. Four LSTs, therefore, were to transport a complete assault battalion and all of its attachments of tractors and tanks.

We were ordered to load for combat, and finally were assigned the top deck of an LST for organizational equipment, which included 5 2½-ton trucks and trailers, 4 ¼-ton radio trucks, kitchen equipment, a 20-day supply of expendable items, and other impediments. All of this equipment was water-proofed, packed and loaded on time, but not without difficulty. As in the Eniwetok operation, an emergency supply of fuel, oil, rations, ammunition, etc., was loaded on each LST in the event it was necessary to use these craft as floating bases. We drew from the Marines 40 new LVT A1s which had to be processed and re-supplied with missing items.

The training program was accelerated, and vehicle training coördinated with vehicle availability. After all vehicles had been completely equipped and worked over, and before they were finally loaded, all companies conducted trial water runs of 12 miles, culminated by platoon and company firing problems on both land and water. During the runs, all phases, such as communication, control, etc., were tested. A three-day period of maintenance and equipment rehabilitation was conducted just prior to loading for the rehearsal. Our only training with the Marine division consisted of a CPX based upon the plans for the coming operation.

Five days before the final loading for the rehearsal, the battalion was issued 16 LVT A4s equipped with 75mm howitzers. Since this had been anticipated, classes within the companies had already been conducted by instructors from assault gun platoon of the old medium tank battalion. These LVT A4s were not equipped with machine guns, and in order to have tank assault gun teams it was necessary to assign them within the companies. Each company got 4 of the craft and distributed one to each platoon and one to company headquarters. The platoon leader used his as a command vehicle, as he was in a position to support either section of his platoon. The LVT A1s had an additional mission of protecting the assault gun and its scarf machine guns. Prior to loading they made a trial run and each crew fired 75 rounds from land and water.

With few exceptions the organic communication setup for an amphibian tank battalion was used. Each command tank was equipped with an SCR-508, other tanks had SCR-528s. The battalion was assigned 5 FM channels for battalion command and company channels. We were required to guard an LVT common channel, which was the common channel of the provisional LVT group headquarters and under which came amphibian tank and tractor units. Each tank company sent a liaison officer with a 510 radio and an operator to the assault infantry battalion. This liaison officer was to accompany the assault battalion commander during the assault. The battalion also furnished each regiment a liaison officer with an operator and a SCR-510 radio. This officer was to accompany the regimental commander in the assault. A 510 radio was also on the division command ship. At all times the tank company was in contact with its assault battalion, and I was in contact with the regiments as well as the assault battalions through regimental liaison officers. Complete water-proofing of all radio and inter-communication equipment was accomplished after much experimentation. Communication proved excellent during all phases of the operation.

The rehearsal, lasting 6 days, consisted of a series of assault landings in which the exact formations and tactical plans to be used in the pending operations were employed. After completing its rehabilitation, the unit was ready to embark, and re-loaded during rough weather.

On May 19, we arrived at our base, where we spent 5 days rehabilitating vehicles and supplying the articles found missing during the rehearsal.

The task force arrived at its forward base on Eniwetok, on June 8. Final orders were issued and last minute supplies taken on, and on June 12 we left for the target area.

The Marianas are a series of islands lying about 1,200 miles southeast of Japan. The main islands are Guam, Saipan, Tinian, Pagan and Rota. Unlike the previously assaulted coral atolls these islands are volcanic in structure. The Japanese headquarters for the Central and South Pacific Area was located at Garapan, the capital, which is on Saipan. Intelligence reported approximately 60,000 enemy troops in the Marianas, 30,000 on Saipan, 10,000 on Tinian, and 20,000 on Guam.

The natives are nine-tenths Japanese civilians and one-tenth Charmaros. Since these islands had been under Spanish control until 1899, the Charmaros were a mixture of Spanish and Polynesian. Ruled by Germany until the end of World War I, the islands were then given to Japan, and at this time were being used as a staging area for the Central Pacific.

The Assault Plan

The first phase of the assault was to be an attack on Saipan by a "Northern Landing Force," and the second phase on D-plus-three was to be made against Guam by a "Southern Landing Force." On approximately D-plus-20 the assault on Tinian was to be made.

Two divisions abreast were to land on the southwest of Saipan. They would go in with two regiments in line, each regiment having two assault battalions. The landing, therefore, would be made over a 4,000 yard front with 8 battalions abreast.

The Marines, on the south flank, were to land on 4 beaches, each approximately 500 yards long. The plan was for the first wave of amphibian tanks, and the second and third waves of tractors which carried assault troops, to hit the beach and move inland, by-passing all organized resistance. They were to proceed inland for approximately 2,000 yards to the "0-1" line, which extended along the first high ground on that side of the island. Here the infantry, carried in by the first two tractor waves, was to unload, and with the support of the amphibian tank battalion, was to set up a perimeter defense to protect the landing of the remainder of the troops. The following tractor waves were to unload their infantry on the beach. It then would push forward to the 0-1 line as quickly as possible, cleaning out all enemy resistance within the beachhead perimeter. All tractors were to return to the water rendezvous after they had unloaded their troops. The amphibian tanks were to remain in support of the infantry until relieved by the land tanks.

For the continuation of the attack beyond the 0-1 line, three possible plans were devised as follows:

Plan 1—If the initial beachhead line was taken *early* in the day and *with a minimum of personnel and vehicular casualties,* the Marines on the left flank of the assault were to be loaded in 150 LVTs and, protected by medium and amphibian tanks, were to launch a mechanized attack on Aslito airfield. The Marines on the right would support the attack by pushing forward. Other Marines would be landed to take over the left flank area and would push forward to protect the mechanized attack from an enemy counterattack from the high ground on the north.

Plan 2—To be used if the assault troops occupied the 0-1 line *early* in the day, but had *sustained medium personnel and vehicular casualties.* It called for the landing of additional Marines on the left flank, loading them in 150 LVTs and launching a mechanized attack as described in Plan I.

Plan 3—To be used if the assault troops arrived at the 0-1 line *late* in the day *with medium personnel and vehicular casualties.* This plan called for launching on the following morning over the entire front an attack supported by medium and amphibian tanks.

The Landing

D Day, June 25, was perfect for an assault. From the division command ship, I was unable to contact my battalion by radio because of distance and interference, and shifted to the air observers net in order to follow the course of the assault. On it I followed the progress of the tanks and tractors until I went ashore at 1230 to establish contact with my companies.

Company B, which supported the 1st Battalion of one regiment, was to land on the beach, then proceed through the town of Charan Kanoa to the 0-1 line about 2,000 yards inland. As the action occurred, the men approached the beach under medium small arms and artillery fire and mounted the reef about 800 yards from shore. While crossing it two vehicles were lost, and on moving inland toward the town, two more vehicles were temporarily lost when they hung on stumps or bogged in shell holes. Company B had planned to pass through the town in line of platoon columns, reform their company in line formation, and proceed over the open ground just beyond the town to the 0-1 line. Although a small lake was known to be in the area there seemed to be a sufficient amount of hard ground to permit passage. This assumption proved incorrect. The majority of the ground beyond the town was in rice paddys which an amphibian tank could not negotiate. Plans were therefore changed. The company crossed the open ground without receiving heavy weapons fire, and proceeded in a canalized fashion along the one road leading from the town to the 0-1 line, which it reached at 1000 hours with 13 tanks. It was then ordered by the assault battalion commander to wait for infantry support. At about 1800, Company B was released to return to the beach for refueling and resupply.

Company A, in support of the 1st Battalion of a Marine regiment, was to land and proceed in line to the 0-1 line. It approached the beach under heavy small arms and mortar fire, lost some vehicles in crossing the reef, and landed. About 800 yards inland it was stopped by the rice paddys. Unable to find a way around, it tried infiltrating through, but after three or 4 vehicles bogged down, encircled the right flank of the swamp. Only 8 of its tanks reached the 0-1 line on D Day. The others were either on the reef, hung on stumps or in ditches, or had been destroyed by fire while advancing. At 1800, the company was released for refueling and resupply. At the end of D-plus-two, it had 5 tanks operaing and had suffered about 50 per cent casualties, including all company officers.

The mission of Company D, supporting the 1st Battalion of another Marine regiment also was to reach the 0-1 line at a point, 1,500 yards inland. It too met heavy small arms and mortar fire while going in. Three vehicles were lost as it proceeded inland, and on crossing the open ground it came under heavy artillery fire and lost two tanks before the enemy guns could be knocked out. The company arrived at the 0-1 line at 1000 with 12 tanks, and remained there until 1800 when, less one platoon, it was released for refueling and resupply. The platoon remained on the line overnight in support of the infantry.

Company C was in support of the 2d Battalion of the same Marines. Its right flank platoon, aided by a company of infantry, was to move forward and clean out enemy installations on Aganin Point. It had partially accomplished the mission when ordered to withdraw because the area was to be covered by our own air and naval gun fire to discourage a probable enemy counterattack. The platoon remained near the beach and helped infantry personnel clean out enemy pillboxes. Seven of Company C's tanks arrived at the 0-1 line at 1000, and remained overnight supporting the infantry and returned to the beach the following morning to refuel and resupply.

By 1000 on D Day the battalion had put 40 tanks on the initial beachhead line. They were placed in defiladed positions from which they could support the infantry. Although very few casualties were suffered on the 0-1 line—since most enemy fire was directed at the immediate beach area—by the end of D Day the battalion had approximately 28 tanks operating and had had about 100 casualties. During the afternoon, additional Marines came ashore and went into a front line sector. That evening the enemy launched an armor-supported counterattack and penetrated to the beach, but the next day were driven back.

On D-plus-one Company B was attached to a regiment of Marines, and the remaining companies, with all serviceable tanks, returned to the front lines and supported infantry attacks. Until D-plus-11 the amphibian tanks continued to support the infantry, either operating with the land tanks, or supporting them by fire, or leading the attacks when land tanks were not available. During this time it was necessary to reorganize the battalion into three provisional companies in order to rest the men and rehabilitate the vehicles. Two of the companies were kept on the line and one in the battalion bivouac.

On D-plus-two, the battalion rear echelon came ashore and a bivouac area was established where all disabled vehicles were assembled for repair or salvage of usable parts. On D-plus-three, the companies were placed under battalion control and daily two of them were attached to the two assault regiments. On D-plus-9, the bivouac area was moved from the beach to a wooded area on the 0-1 line, a mile in from the beach.

THE FINAL PHASE

During the final phase in Saipan's capture, amphibian tanks were used from the water to aid the infantry in cleaning out caves along the shoreline, and also to encourage the civilians that were in the area into surrendering.

On D-plus-12 the battalion was released from further combat, alerted for the assault on Tinian, and instructed to rehabilitate as many vehicles as possible.

The assault on Tinian was to be made on two narrow beaches approximately 65 yards wide and 1,000 yards apart. Amphibian tanks were not to land in the first wave because the beach areas were known to be covered with mines. They did, however, lead the assault waves to within 300 yards of the shore, then pulled to the flanks and supported by fire the landing of the infantry from tractors.

The two available companies of my battalion were not used in this landing, but were loaded on LSTs that were lying off Tinian awaiting orders to land if needed. On July 25, Y-plus-one, one company was called ashore to support the medium tanks in an attack. The following day the remainder of the battalion went ashore, and until July 28 was used in the front lines to support and protect the land tanks in their attacks. On July 29 the battalion was released, and loaded on LSTs for the return to the Hawaiian area.

During this operation, the battalion sustained about 31 per cent personnel casualties. Sixteen tanks were completely demolished; 14 were partially demolished or mechanically disabled and shipped via LST to Pearl Harbor. The battalion loaded 38 amphibian tanks and 4 amphibian tractors for the return trip.

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Should We Violate Principles of War?

by Brigadier General Hamilton S. Hawkins, Retired

AFTER every war we are too prone to regard the manner in which it was fought as a standard by which we are to fight the next one. With some exceptions, of course, our schools teach military students the tactical methods by which our victories were won. Too little consideration is given mistakes made, or standard methods which even though they were successfully applied, were not good, or at least could have been improved upon.

I

At the beginning of World War II, it was easy to predict that the Germans were going to use armored forces to the very limit. If needed, the campaign in Poland was a preview of the methods that we should have expected the Germans to use. Taking advantage of the weaknesses that they knew existed in the French and British armies, the Germans justifiably decided to make a speedy and rapid war of movement, in which they relied chiefly on their armored forces. They knew that the short Maginot Line could be by-passed, at least temporarily; that the Allied armies were not equipped with sufficient or large enough caliber antitank guns. They knew that they had superiority in the air; and that the trend in the Allied armies was to give more importance to strategic bombing by the air forces than to the tactical use in support of ground armies. They also knew that the cavalry regiments in the armies of their opponents were being mechanized, and that even if horse cavalry were retained it was not properly equipped or trained for modern warfare.

All of this led, naturally, to the German expectation of a quick victory over France, and over any other European states that might oppose them. From here on, the Germans were unimaginative. They believed that the occupation of France, Belgium, Holland, and Norway would put them in a position to defeat England by submarines and by air, and perhaps even by invasion. After the defeat of England they thought it would be easy to take care of Russia; that the use of mechanized troops would render it unnecessary to use cavalry, and that the Russian army was ill supplied and equipped, and, if necessary, could be beaten almost as quickly as that of France.

Certainly after the Polish campaign the military authorities in France, England and the United States could, and should, have foreseen what was coming. It was obvious that the German mechanized forces were going to move and fight on or near roads. It should have been obvious, therefore, that the only way to stop them was by antitank guns in great numbers, tactical air forces, and properly equipped and trained cavalry able to maneuver boldly across country. It should have been apparent that infantry, heavily supported by artillery, would remain the basic arm for both defense and attack. It should have been realized, however, that without the elements just mentioned—antitank units, tactical air force and cavalry—the infantry would be unable to stop the rush of German armor.

The Allies did not have armored forces to compare in quantity or quality with those of the Germans. What armored troops they had were used improperly. The tactics of armored troops had not been developed and, in my opinion, were not truly understood even by the American army in North Africa, Italy, and Europe during the latter years of the war.

It was thought that the absence of armored troops in the French and British armies was the reason for the German success in 1940; but this was only partially true. The elements already mentioned could have made a successful defense without armored forces. The great advantage of a large armored force, as developed later in the war, was for defensive operations after our infantry had made it possible for the armored forces to break through.

It is not hindsight at all that prompts these observations. They were manifest at the time, and were often stated. After America entered the war there were many tactical errors made that should have been avoided. Although there were many brilliant actions fought, our tactical leaders should have been, and could have been, better trained if our War Department staff and school authorities had listened to several voices that were crying in the wilderness before and during the war. It is not intended to accuse all of our tactical leaders of these errors, but there were too many of them who were guilty. Here are a few of these errors:

II

Infantry regiments were deployed for battle in a uniform, continuous line of skirmishes across all sorts of country, whether cover existed for some of the smaller units or not. Troops should not have been required to advance over long open spaces without cover. Rather than this, the various columns should have assumed narrow fronts and greater depth so as to advance only over country that was rough, broken, or wooded enough to afford the deployed soldiers a chance to use cover skillfully, and to reach the enemy without being killed or wounded. Open spaces should have been strictly avoided. Although some casualties are inevitable, every soldier has a right to feel, after experience in several battles, that he has a fairly good chance of getting to the enemy and destroying him without being wounded or killed. The realization could have been acquired only if skillful tactical methods had been used by the leaders of both large and small units. In many cases, tactical leadership was excellent; but too often it was poor. Poor tactical leadership can be charged only to insufficient or incorrect training during the preparatory period in this country. The individual training of soldiers in the use of arms and on obstacle courses, however thorough, cannot make up for poor or inadequate training of tactical leaders.

Too often higher commanders did not allow the necessary time for commanders of combat units or groups to look over the ground on which they were about to commit their troops. This impatience came from ignorance, or from similar pressure from still higher commanders. Of course, such pressure often is necessary to overcome the lack of initiative or over-cautiousness of some subordinate commander. But too frequently it comes from sheer ignorance of what the smaller unit commander has to do to skillfully conduct the advance without too many casualties.

Troops that have been treated in this way will stand for heavy losses a certain number of times, but, eventually, they lose their morale through lack of confidence in their leaders, and because of their certainty that they have little or no chance of getting through a battle without being killed. When this occurs, it takes new leaders, and skillful and considerate handling, to restore morale.

III

Another tactical mistake, especially noticeable in the larger units, is overdispersion. For fear that the enemy may take advantage of some ground that is not occupied by our troops, either in attack or defense, some commanders of large units have spread their forces over entirely too long a front. The desirability of covering the whole critical front may be obvious, but if there are not a sufficient number of troops available to do it properly it is a serious error to attempt it. No command should be spread out to such an extent that its several parallel columns are beyond supporting distance from each other. Furthermore, provision must be made for the establishment of a suitable reserve.

Each column must have some depth, and, in addition, a general reserve must be established. If this cannot be done, the front must be narrowed until it can be, even if some of the front for which the commander is responsible is left without any troops. The front assigned may be larger than the unit can take care of as its commander might wish. The only solution is to dispose the unit into several columns or groups within supporting distance of each other, keep back a reserve, scout the vacant parts of the front with small mobile elements, and trust that any enemy forces that may venture into this vacant area may be attacked in flank.

If it is a question of defense, a command too small to cover the entire front properly must resort to delaying actions conducted to prevent any enemy of superior strength from enveloping its flanks and surrounding the command. It is certainly better to fall back, with the command in hand and fighting delaying actions, than to make a stand so prolonged that the command may be surrounded and destroyed.

The most flagrant violations of these principles during the recent war were the overextension of the II Army Corps southeast of Tunis, North Africa, in 1943; and the overextension of certain large units of the U. S. First Army in the Ardennes region of Luxembourg and Belgium, which resulted in the Battle of the Bulge.

The defeat and near disaster to our II Army Corps in North Africa apparently was due to two things: the lack of clear-cut mission, and the dispersion of the corps over a front of approximately 70 miles by direction of the British high command in that area.

General Rommel's army was halted facing General Montgomery's 8th British Army at the Mareth Line. Our II Corps was ordered to move toward the Mediterranean seacoast with the object, as far as we know, of cutting or harassing Rommel's line of retreat toward Tunis. In the first place, this was a very dangerous mission for one corps, unless it was merely to harass Rommel's line of communications and fall back in case the Germans attacked in force. There should have been no misunderstanding as to exactly what the corps was to do. In the second place, the several columns of the corps should have been kept within supporting distance of each other instead of spreading over such a wide front. No reserve was provided. All the Germans had to do was to select a point of attack along the extended front and attack it vigorously with superior forces. This they did, causing great demoralization, and severe losses in men and material. To save the reputations of the top British and American generals, the defeat was laid to the "greenness" of our troops. This outrageous slander against troops that had been well-trained—and therefore were not green, even though it was their first battle—and who fought most gallantly and efficiently under impossible circumstances against overwhelming odds, was a shameful incident, the truth of which should be brought out in our official history of this war. Never were excellent troops more mishandled and maligned. From all available information at this time, the British generals who intervened in the handling of this American corps were principally to blame. The incident should be studied as an example of the violation of the important principles mentioned above.

The initial success of the Germans at the beginning of the Battle of the Bulge was due, certainly in part, to our violations of the tactical principles discussed above. The area selected by the Germans to attack on December 16, 1944, was lightly held by American troops. This may have been entirely justifiable, as afterwards claimed by our high command. This is not the point involved, however. The fault rested not with the gamble taken to hold that area lightly, but with the manner in which the troops assigned to hold the area were dispersed.

Assuming that it was justifiable to hold the area lightly—the troops assigned for that purpose should have been kept in hand. The various units should have been kept in supporting distance of each other, and a general reserve held back, even though this would have left long portions of the front unoccupied. The vacant areas could have been scouted. When the attack came in great force, the commander of the area should have ordered his troops, not to hold at all costs, but to withdraw when their flanks were threatened with envelopment, and to fight delaying actions. This would have required the whole force to have been kept in hand instead of spread out so that the smaller units were completely out of touch with each other and there was no coördinated movement of the whole force. Delaying actions with the force in hand might not have resulted in much delay unless the troops were very mobile and could threaten the flanks of some of the German columns. The disjointed manner in which the troops did actually fight, however, effected no delay whatever, and resulted only in the utter destruction of some rather large units which might have been preserved to fight again as the resistance stiffened with reinforcements gradually brought in, as actually happened. The complete destruction of all of those troops originally holding the area was unnecessary and stupid.

Applying these same principles to the whole group of American armies, which included the Ninth, First, and Third, it must be remembered that this group was engaged in offensive operations, and gaps between them, under these circumstances, are not unnatural or necessarily due to faulty generalship. As long as each army was kept in hand, the gaps were not of serious consequence provided that a large general reserve had been established. To have proceeded without this reserve was a serious error. If there were not enough troops available to constitute this reserve, the whole front should have been shortened. It is a mistake to let the enemy induce you to overextend your forces merely because he has overextended his own. If he has so many troops available that he can cover a wider front than you, it is still a mistake to overextend your lines for that reason. Smaller armies have beaten larger ones by superior maneuvering, surprise, and good generalship. But no such success has ever been won by overextension without sheer luck, superior troops, or other factors which sometimes win despite bad generalship.

IV

Criticism of the manner in which mechanized cavalry reconnaissance groups were employed, especially by corps commanders, is justified. These squadrons were not armed, equipped, or organized to fight serious and prolonged actions, and they should not have been used on such missions. The best that could have been expected of them was to provide security against surprise and ambuscade of the units they were covering.

Mechanized cavalry was not organized to seize and hold critical points or ground until other troops could be brought up, to fight delaying actions, attack the enemy in flank or rear; maneuver in strength across country, fill gaps between large units, accomplish distant reconnaissance, or pursue across country on the flanks of the enemy. Security for other troops was the only, or almost only, mission for which they were suitable. And yet, they were called upon for other missions, which they performed as best they could, very gallantly and with heavy losses. Strong forces of horse cavalry were needed; however, had they been available it is possible that they would have been wrongly employed. The education at our service schools of our prospective leaders between World War I and World War II was not satisfactory in so far as the employment of cavalry was concerned.

V

The organization and training of a tactical air force as an organic part of our ground forces had been neglected during the 23 years between the two big wars. Just as the navy needs a carrier air force as a tactical part of a fleet, so must the army have a tactical air force as an adjunct to ground operations. American air authorities, however, considered a strategic air force of far more importance, and consequently, we entered the campaign in North Africa without a tactical air force specifically designed to work as part of our ground force command. The British RAF had made the same mistake all through the war up to that point, and we followed suit. The result was that our Allied ground forces did not receive the air support that the German ground troops did in that campaign. This was corrected only during the last operations of this campaign. In western Europe our air forces seem to have cooperated with ground troops very well, but this important element in an army should not have been left to improvization after the war began.

CONCLUSION

No one knows as yet how the development of the atomic bomb, robot airplanes and radar will affect the future of armies and navies. It is certain, however, that unless these new inventions of science bring about the certainty of permanent peace, armies and navies will be retained. The errors of the past, therefore, must be studied by military men, so that in the future they can be avoided.

Editorial Comment

E PLURIBUS UNUM

During the last two years or more a great deal has been written and spoken on the subject of unification of the armed forces of this government.

The problem has been discussed pro and con by our armed forces, the Congress and by the public and press until practically every argument for and against unification has been submitted. Further detailed discussion editorially in these columns would therefore only be repetition.

However, The Cavalry Journal feels strongly on the major issues. First, that the experiences of the war, and the carefully formulated statements of the country's foremost military and civilian experts, point to the inadequacy of our present organization to achieve its intended purpose. A careful analysis of the facts and figures of the past war has proven even to the most skeptical that the United States has problems which can be solved only by an overhaul of our armed forces machine. Even those who oppose the solution by unification agree to that. Second, whatever the decision is, it should be made promptly and positively. Further delay is extremely dangerous.

From an analysis of the testimony made public to date, it would appear that a majority of the opponents to unification are not so strong against unification itself as they are to the details for carrying it into execution. Of course there will be many "bugs" in the initial plans, but these so-called "bugs" will be gradually eradicated, and a feasible working plan will be formulated.

What are the problems involved in this plan of unification? In general they appear to be: (1) How to allot the proper share of the whole responsibility of military and naval defense between the three arms —land, sea and air. (2) How to amalgamate these three conceptions of mission into a joint strategic plan. (3) How to train combat units of these arms in peace to operate as a joint force in war. (4) How to obtain command and staff officers in each arm with sufficient knowledge of the purposes, methods and uses of the other two. (5) How to allot to each arm its proper proportion of the allotment of men and money and matériel set aside for military operations. (6) How to cut the cost of the armed forces' establishment to the lowest possible figure through joint procurement of common supplies and services.

Have not the experiences of the last world conflict proven that the conduct of modern war is possible only with unified command and joint operations? How then can these operations be assured?

It is a question of organization, method, technique. There is no question that, should war come, the need for command unity and smoothly functioning joint operations will be imperative.

In what way other than a single department can we have a smooth functioning command ready in war—a command ready to roll when the alarm rings in, because it existed, studied, trained, and acted as a unit in peacetime?

How, but in a single department, can we get the correlated training for efficient joint operations, eliminate absurd and unnecessarily costly duplications of effort in the purchase, storage, distribution, and issue of supplies and manpower to provide for the needs common to the air, ground and sea forces?

How else can be created and trained a team of co-equal arms as a powerful efficient instrument of protection for our national policy, and with a minimum budget made possible by the elimination of competitive interests?

Opponents of unification have, as a rule, based their objections on such issues as the loss of sentiment, tradition, and *esprit* under unification. They claim that one service might be in a minority, or that the operations might be in the hands of those who do not understand them—that with three services and two top positions there will always be a time when one will not occupy a top position—that unification would eliminate healthy competition between the services. There are others, but like those cited above, there seems to be a pretty sane and practical solution for each objection. Most of these issues are mere details which can be ironed out for the common interests of our national protection. They serve only to cloud the main issue and its solution.

At the risk of going out on the deep end, The Cavalry Journal submits the following answers to the opponents of unification:

Sentiment, tradition, and *esprit,* under the present plan of unification, would not be lost. They would still be fostered and retained by personnel and units, the same as before. The air force, the army, and the navy would keep their separate identities and staffs.

As far as the minority issue is concerned, the very essence of the plan is that no service can go its own way without consideration of the *total* problem of military security. The Cavalry Journal cannot believe that persons who have reached the important positions as outlined in the plan would "gang up." How could the operations of any one of the three services be in the hands of those who do not understand them when the Chief of Staff of the Armed Forces is a policy and strategy official? Operations are left with the army, the navy, and the air force, or (in case of war) with the supreme commander in the field.

It is true that there are two top positions, but the professional heads of each service always sit in with the Joint Chiefs of Staff. Their views will always be heard.

There is still room for healthy competition between the services under the plan, and it will be *healthy* competition and not needless waste. A control at the top is just what is required to keep it from going from the *healthy* to the waste angle.

According to The Cavalry Journal's research in the matter of unification, the Secretary of War, Generals Marshall, Eisenhower, MacArthur, Arnold, Devers, Spaatz, Kenney, Doolittle and nearly all other officers who have had big war responsibilities are in favor of unification. The Joint Chiefs of Staff Special Committees were for it 3 to 1. The Joint Strategic Survey Committee comprising an admiral, a ground general, and an air general, were unanimously for it. At least 50 per cent of top naval commanders, when interviewed in 1944, were for unification. We have also been informed by reliable sources that the American Legion, the Reserve Officers and National Guard Associations are in favor of it. Seventy-five per cent of the Press, as shown by editorial comment, and 64 per cent of the public as shown by the Gallup Poll, are for unification.

Surely the issues are clear—the arguments have been heard. Further discussion would only seem to delay an important decision for purposes other than of national interest. Yes, the decision should be made promptly, and the plan put into effect immediately thereafter.

American Saddle Club

It is interesting to note the number of horse organizations that are springing up all over the United States. Groups of men, women, and children who share a common interest in the horse and in riding, are joining together for recreation and fun.

One of these organizations is the American Saddle Club. From what started as a simple effort to promote friendship, understanding, and hospitality among people who are fond of horses, has grown a national association of horsemen of every inclination. They now publish a monthly magazine called *The Quirt and Crop.* It is a very good little publication. If you are interested in horses, why don't you drop a line to Ray Fox (the Editor), Box 1227, Rapid City, South Dakota, and ask him to send you a sample copy and also all the dope on the association?

* * *

4th Armored Division Association

A group of former 4th Armored Division members are organizing the 4th Armored Division Association.

It is requested that all interested former members of the 4th Armored Division please notify THE CAVALRY JOURNAL of their present mailing address. We will be glad to forward this information to the acting secretary of the association.

No political or commercial aims are contemplated by this organization.

Armored Divisions' Combat Commands[★]

by Lieutenant Colonel Wayne D. Smart, Cavalry[★★]

The armored division is organized to provide flexibility in the formation of tactical teams. The self-contained battalion is the basic unit.

Units are attached to the two combat command headquarters and to the reserve in accordance with the mission, the terrain, and the enemy situation. Additional separate tank battalions, armored or other infantry, artillery, engineer, tank destroyer, and antiaircraft artillery units, are attached as available and as the situation dictates. (Field Manual 17-100, The Armored Division.)

IN the organization of an armored division there are incorporated two groupings known as combat commands and a third grouping known as the reserve command. These groupings are so organized as to provide a task headquarters for any mission the division commander may designate. Field Manuals say little of these combat commands; yet usage and intent have materially affected the employment and success of all the present armored divisions.

During the early days of armor and amalgamation at Fort Knox, Kentucky, two historical cavalry regiments as well as a famed infantry regiment and artillery unit formed a command under the banner of the 7th Cavalry Brigade. The symbol of this unit was the familiar tank track and cannon on a "field" of cavalry yellow. Shortly after the gathering of these various units, the 1st Armored Division was formed and activated. When this occurred, the 7th Cavalry Brigade minus the infantry became the 1st Armored Brigade and a subordinate headquarters under the 1st Armored Division Headquarters. Its function was to coördinate the operation of the elements of the division during all tactical operations. It performed the function of command but not of administration. Being the only headquarters in the chain of command between division headquarters and the regiment, and operating actively then only during tactical phases, the 1st Armored Brigade soon assumed the characteristics of a "fifth wheel" in the chain of command. Its value was not underestimated nor was it poorly staffed. There existed a definite need for such a command but not merely as an adjunct to division headquarters.

With the activation of the 1st Armored Division the fact that there was only one brigade headquarters caused an unnecessary overlapping of command functions; so, at a critical moment in the fortunes of the Armored Forces, the combat commands were born. The combat command was the brain child of that Grand Old Man of the Armored Forces, General Adna Chaffee, who, sagaciously counselled by his staff of now famed leaders of our armored divisions, fostered the original idea and fondly watched its growth during his last years.

He visualized that the combat command would be a headquarters of a tactical nature to which could be attached any number of battalions or other units that might be required for a particular task. It is believed by older members of the Armored Forces that General Chaffee never intended that any set composition be made for any combat command, that it should be flexible and not permanent nor even semi-permanent. Its characteristic of being purely tactical in organization would have normally prohibited its retaining any degree of permanency.

However, during the past campaigns in Europe, many armored division commanders chose to create combat commands of fixed composition. Looking over reports, one finds the same units in Combat Command A throughout the entire European action, although it is certain that conditions varied from day to day as the battles progressed from St. Lo to the outskirts of Berlin. This tendency to fix the composition of the combat command restricts the inherent flexibility of the idea fostered back in Kentucky by General Adna Chaffee. This method of using the same combination is inclined to build up "the responsibility feeling" for the attached unit over and above that normally intended. It is inclined to take some of the division headquarters' duties and pass them on to the combat command headquarters which, normally, is not staffed to handle such extra problems. When the combat commands organize small task forces within the command, one begins to wonder just what the division headquarters is doing.

In some armored divisions which earlier operated under the old T/O, there was the matter of regimental headquarters to consider along with the combat command headquarters. Combat Command B of one armored division superimposed its headquarters on the regimental headquarters of one of its armored regiments, which was the largest headquarters in the combat command, for the operations in Africa. The double "issue" of staff officers for one position made some confusion initially, but in due time this was worked out. The need for extra liaison officers and replacements usually took care of any extra personnel. In other divisions which had similar organizations the creation of small task forces within the combat command took some of the regimental staff as commanding officers.

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In the armored divisions, which were activated under a new Tables of Organization, there were many different interpretations of the functions and employment of the combat commands. Generally speaking, most of these new armored divisions utilized their combat commands as formations of standard size and type, assigning to them the same battalions regularly, and supplementing this organization with whatever other units not organic to the division there were available and suited for the particular mission. This idea violates the principle of flexibility set forth by General Chaffee; but the rebuttal points out that understanding and coördination are obtained between units which have worked together, that training, liaison, and coöperation reach their highest peak when elements continue their relationship day after day. One armored division in particular has followed the basic idea of General Chaffee in that no regular assignments were consistently made to each combat command. Each mission dictated the assignments of units to the combat command: that two up to six battalions may be attached to one combat command depending on the situation.

Some armored divisions made an equal split between the combat commands, giving to each CC an equal number of tank units, infantry units, and artillery. This "balanced" formation was particularly effective against a demoralized and defeated enemy. It is a formation which facilitates the exploitation of a hostile country. It can be further broken down into "task forces" within the combat command, as was frequently done by our armored divisions in Germany, in order to make rapid advances in multiple columns, to harass a worried enemy, and to disrupt any attempt to reorganize by a fallen foe. The principal disadvantage of this type of organization was found to be a dissipation of strength over the battle area. Plenty of harassing action was accomplished; but when the enemy defended in any sizable force, the small task forces were made to bypass these enemy strongpoints. The composition of a combat command using the "balanced" formation normally would be one tank battalion, one infantry battalion, and one artillery battalion. To this group were added some engineer, reconnaissance, medical, and maintenance elements. Any other troops, not organic to the armored division, would likewise be evenly divided among the combat commands. For a fluid situation such as we had in the closing days of the European war, this "balanced" formation worked fine.

Some armored divisions are reported to have favored the "unbalanced" type of combat command; that is, the armored division was organized into combat commands according to the type of weapon and equipment of the battalions. Consequently, one combat command would have attached most of the infantry battalions, and the other combat command would be composed mostly of tanks. Of course, these same combat commands would have other troops such as the engineers, reconnaissance, attached antiaircraft, tank destroyer, and supply support within the organization to make up the complete combat command; but their main force would consist of either tanks or infantry. Sometimes the abruptness of the division would be tempered by attaching a company of infantry to the tankers, and vice versa with the tanks to the infantry combat command. This combat command possessed great shock power in massing the tanks in one organization, and a good base of fire in the collected infantry battalions in the other combat command. When the artillery battalions were added, attaching one to the striking force and the remaining organic two to the base of fire, it made this formation one of the most powerful attainable. The arrangement had a few disadvantages. Theoretically, the base of fire would be in position to support the maneuvering force, the tanks; but reports from the European theater state that frequently the infantrymen of the base of fire would become involved in a local battle while the tanks were engaged in another some distance away. Both commands would ask for the other's support but would not be answered. Sherman was certainly right!

It has been discovered in such unbalanced combinations, the infantry attached to the tank combat command was not enough in number to support adequately the tanks and sustain the high casualty rate. The practice of fighting dismounted, caused by enemy actions, expended many infantrymen who were not protected by even the thin plate of a half-track vehicle. These men would endeavor to consolidate a position taken by the tanks, but with their few numbers they would be unable to withstand the strong German counterattack. The tanks in some cases would lend assistance; but normally in the German situation, they would continue attacking the enemy until they had outrun their infantry support. Frequently the strength of the attached infantry would be further dissipated by having to guard prisoners of war. Even the prisoners captured originally by the tanks would have to be turned over to the infantry in order to release the tanks for further gathering of prisoners, etc., etc. There is no question, but what this is one good use for armored infantry with tanks, but the point is that there are not always sufficient soldiers to "go around."

This is one of the points almost all armored division commanders agree on; that is, that the armored infantry should be doubled (and even some commanders think tripled) in a new organization of the armored division.

Another combination favored by one armored division was to retain division control of all artillery battalions. This policy was habitual unless the combat command was on a detached mission, in which case the necessary artillery would be assigned to it. The artillery so consolidated and controlled did not constitute a combat command. This arrangement meant that while no combat command had any artillery directly under its control, it was able to call for direct support from the combined artillery battalions and receive the maximum fire of the division, if the target warranted it.

The employment of a third combat command varies in different armored divisions. It is believed that this combat command was first thought of as a reserve set up to act as a pool for all combat elements not assigned to combat commands. It was not used as a tactical headquarters except on a few rare occasions where the objective was very limited or the mission was a defensive one. The Tables of Organization do not allow many men for this headquarters, three officers and five enlisted men; so whenever this headquarters was considered for any contemplated action other than acting as a headquarters for the non-assigned combat elements, it would have to obtain additional staff officers from division headquarters to handle the situation adequately. Again, it has been pointed out, by one of our successful and famed armored commanders, that this thought was the original conception for this command by General Chaffee. He did not intend it to be a third combat command, although in some armored divisions it has attained a place "in the sun" equal to the other combat commands.

How about the organization of the armored division with its combat commands in the Pacific theater? We realize that there were actually only a few places where an entire armored division could operate. If the terrain did not restrict the employment of this organization, then the facilities to support such a unit were lacking or were considered beyond the value of the unit in the theater. Therefore separate tank battalions were used in this zone in conjunction with the infantry. These separate tank battalions might well have been consolidated under a combat command, but then the first thing that would have happened would have been the counterpart of an armored division. No, the mission of tanks in this area was to support directly the advancing infantry. The tanks of a battalion might well have been divided among the combat teams of the infantry divisions and have found that their chief rôle was supporting the doughboy. It is questionable if tanks would ever have operated alone. Rather, it was felt that tanks employed here must be more of an adjunct to the infantry elements and must lose their identity as separate tankers.

In this discussion of combat commands, there enters that radical but paradoxically same question, *Why combat commands?* Why should not the armored division be so organized, with regiments similar to the infantry divisions? These regimental headquarters with their more permanent staffs would supplant the combat command headquarters with its limited staff. Each regimental headquarters would have tactical and administrative control of all elements of the regiment plus any attachments. The regimental headquarters would take over all the functions now performed by both regimental and combat command headquarters.

Each regiment, of which there might be three in the Tables of Organization for an armored division, should have three battalions. Remembering the dire need for additional infantry, it has been proposed that these battalions be made up of three companies each, one of these companies to be a medium tank company and the other two, infantry companies, armored. Or, it has been suggested that one of the battalions be a tank battalion and the other two be armored infantry battalions. The important point is, in either combination, to have twice as many infantry as tank battalions. The regiment, in addition to the three battalions mentioned, should have the supporting elements such as reconnaissance troop, headquarters company, service company, and engineer company to make it a self-sustaining fighting unit.

This organization would present a working combination which has trained together and understands the mechanics of combined operations as they apply on the battlefield. The regimental staff is always employed in normal functions, both administrative and tactical. The size would be unwieldy but would present a formidable front to almost any opposition.

If the system of separate battalions is retained, then the organization of a combat command headquarters becomes essential. It is felt, however, that if this is the case it is necesary to build up the staff to such proper proportions that they are, in effect, a regimental type of headquarters. This would be inclined to make a combat command a permanent fixture, but flexibility may be maintained by rotating the attachments so that all the division elements become accustomed to each other.

From the discussion already presented, it can readily be seen that the subject of "combat command" is controversial and that a great number of differences exist among the various armored division commanders regarding the composition of the combat commands and their employment. Furthermore, there does not seem to be an accurate solution to the question in that all of the armored divisions have had outstanding successes in their campaigns and encounters against the enemy in Africa, Sicily, Italy, France, and Germany. This fact may prove the point that the type of organization is not the deciding factor in any battlefield success, but rather it is the amount of training and understanding that exists with all personnel, commanders, officers, and "GI's."

In conclusion, can it be said that any formation has the call over another? The "balanced" formation, that is, having at least two of the combat commands similar in organization, has obtained and won many followers because of its application and outstanding success in Europe. The "unbalanced" formation, that of having a striking force composed of the more maneuverable vehicles such as the tanks in one combat command and the base of fire element composed of the artillery and infantry in the other combat command, is theoretically sound and would be used properly against stiff opposition where the flanks cannot be turned in order to effect a breakthrough and exploitation. In both combinations we discover that the combat commands make up task forces; so we end up with the armored division spread out over the enemy like a giant who has tenacious tentacles . . . and after all, that's the idea, isn't it?

21st British Army Group in Europe, 1944-45*

Conclusion

The following article is the conclusion of a lecture given by Field Marshal Sir Bernard L. Montgomery before the Royal United Service Institution, the first part of which appeared in the January-February edition of* The Cavalry Journal. *The first installment told the viewpoint of a commanding general during a major campaign. This final installment tells of additional problems that were met, the special weapons that were used, and appraises the new tactics that were employed.

GROUPING

TO be successful in battle the fighting machine must be so set in motion that it can develop its maximum power rapidly, and the troops must then be launched into battle properly; in fact, what I call "Stage Management of the Battle" must be first-class. The plan of battle must be made by the commander, and in it he must give careful thought to the correct grouping of his formations, his armor, his artillery and other resources. Throughout the battle area the whole force must be so well balanced and poised that there will never be need to react to enemy thrusts; these can then be disregarded and the battle forced relentlessly to swing your way. This requires that the commander should always be thinking far ahead, although of course his final decisions of grouping must await full development of the problem. Skill in grouping, and in quick regrouping to meet the changing situation, is a very great art, and it requires much study before proficiency is obtained.

Consider the Battle of Normandy. I have shown how it was developed and accomplished according to the plan made well before D Day,* and you will notice that the grouping of our resources was such that the enemy was unable at any time to cause us to deviate from our purpose. We held the initiative throughout, and we arrived where we meant to be on time—in fact about a fortnight early. I have already given other examples, particularly in connection with the Battle of the Rhineland and the Battle of the Rhine.

It is worthy of note that in this campaign grouping, and the preserving of correct balance, were more vital than ever. In the northern sectors the magnitude of our commitments compared with available resources made it impossible to provide the text book scale of reserve formations, or indeed anything approaching it.

ADMINISTRATION

In the early stages of the campaign much depended on the successful issue of the administrative planning. The task was a formidable one, and in plain terms meant the export overseas of a community the size of the population of Birmingham. Over 287,000 men and 37,000 vehicles were pre-loaded into ships and landing craft prior to the assault, and in the first thirty days 1,100,000 British and American troops were put ashore.

There was the necessity to foresee and provide all that is required for a major static battle quickly followed by a rapid advance of some 400 miles, which entailed the landing of some 200,000 vehicles and 750,000 tons of stores during the corresponding period. And I can say that even in these exceptional conditions planned operations were never held up even for a single day by any lack of administrative resources.

In the early stages the vast quantities of stores required were landed over open beaches, a task which was greatly assisted by the Mulberry. The stores were directed into a number of field depots, whence they were dispatched to the troops. As soon as conditions permitted, these field depots were concentrated into a single organization called the Rear Maintenance Area.

When the break-out from Normandy occurred, considerable problems arose because the lines of communication became stretched in a short time from Bayeux to Antwerp—that is some 400 miles. All bridges over the Seine were demolished, and the railway facilities extensively damaged. In order to maintain the advance, shipping and the discharge of material were cut well below the figure necessary for the daily maintenance of the force, so as to release every lorry possible for ferrying

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★*The Journal, Royal United Service Institution.*

*See THE CAVALRY JOURNAL, January-February, 1946.

stores forward to the troops. We were thus eating into the reserves built up in the Rear Maintenance Area, and it became a matter of urgency to get bases farther forward and shorten the lines of communication. We had both feet off the ground, relying on opening up the Channel ports, particularly Dieppe, before our accumulated stocks became exhausted. But you have to take administrative risks in war as well as tactical ones; the point to realize is that a commander requires a nice judgment to know when risks are justifiable and when they are definitely not so.

Gradually the railway systems were re-established, and when eventually the port of Antwerp was opened to shipping, we were able to base ourselves firmly on depots established between there and Brussels. We continued to handle subsidiary tonnages through the Channel ports.

I would mention one very important feature of administration which has been confirmed during the campaign. It is that there is a reasonably constant figure covering the combined ammunition and petrol tonnages required, though of course the split between these commodities depends on the type of battle you are fighting.

It is not possible in such a short survey to go into any detail concerning the vast and complicated machinery necessary for the support of a modern army in the field. I will, however, mention the tremendous importance of Movements and Transportation. Their problems in this campaign were immense. There were the numerous technical and engineer problems of repairing and operating the damaged or demolished ports, railways and inland water transport systems of 4 European countries. Bridges had to be built over such obstacles as the Seine and the Rhine. Possibly even more important was the problem of coördinating and allocating traffic over the various means of carriage, and of setting up organizations for operating through services over the different national systems.

The "A" services, too, were confronted with special problems. The calculation of reinforcements required, together with a correct balance for every arm and trade, called for considerable foresight and experience, and had a very direct effect on the success of operations. I will also mention Welfare, which has reached a standard in the army probably never previously approached.

Very great praise is due to the various services and departments which so successfully overcame their problems and difficulties and carried out their functions in such an efficient manner.

SPECIALIZED EQUIPMENT

Early in the planning for D Day it became evident that specialized armored equipment would be necessary to overcome the beach defenses. One of the recommendations made as a result of the Dieppe raid had, in fact, been that engineers should be carried behind armor up to the concrete obstacle which had to be breached. This idea was developed so that mechanical means could be used for placing or projecting charges from tanks without exposing the crews. Tank-carried bridges for crossing antitank ditches were developed as well, and were launched mechanically from behind armor. (See *"Bridge Laying By Armor,"* THE CAVALRY JOURNAL, September-October, 1945.)

The study of the particular problems presented by the Normandy beach defences led to the preparation of further specialized equipment. Mats laid from tanks were used to cross soft patches of clay on the beaches; a turretless tank was used as a means of providing a self-propelled ramp over which other vehicles could scale sea walls; flail tanks for mine clearing and amphibious tanks to lead the assault were ready by D Day, and were integrated with the engineer tanks into well trained assault teams.

Specialized armor made an important contribution to the success of the landings. The beach defences were quickly overcome and the new technique of landing a great weight of armor early in the assault paid an excellent dividend.

As the campaign progressed, the need for special armored devices became increasingly apparent. Against fixed defenses such as existed around the ports, mine-sweeping tanks, flame throwers and engineer tanks were invaluable. The Churchill flame thrower was outstandingly successful throughout the campaign. It has a very great moral effect on the enemy and saved us many casualties.

The D Day technique for the early landing and quick build up of armor was also applied at the crossings of the Rhine and the Elbe. This was made possible by the use of amphibious tanks and amphibious assault craft carrying infantry, light vehicles and supporting weapons. It was largely the use of these craft which allowed operations to be continued throughout the Winter over the flooded areas between the Maas and the Rhine.

Armored personnel carriers were also found to be neccessary, and were improvised from tanks with the turret removed. Their use gave armored mobility to infantry and enabled them more closely to accompany armor in the assault and pursuit. The vehicles, known as "Kangaroos," I shall mention again later.

All these various equipments were concentrated, for training and administration, in a special formation, the 79th Armored Division. They were sub-allotted in support of formations and units as operations required. The divisional commander was responsible for providing competent advisers in the use of the equipment at all levels. It was found that centralization under him was essential in order to achieve flexibility and provide a controlled program of workshops overhaul, rest and relief.

THE ROYAL ARMORED CORPS

The Royal Armored Corps lived up to its highest traditions in this campaign. It was really properly equipped with adequate scales of reserves, and the fighting gave full scope to its flexibility and adaptability.

The outstanding point which emerges once more is that we require only two basic types of tank—the capital tank (for fighting) and the light tank (for reconnaissance). The capital tank must be a weapon of universal application, suitable not only for working with the infantry in the attack and in the dog-fight battle, but also capable of operating in the spearheads of the armored division in pursuit. I am convinced, as a result of experience from Alamein to the Baltic, that it is fundamentally unsound to aim at producing one type of tank for coöperation with the infantry and another for the armored division. We require *one* tank which will do both jobs. I have learned that the ubiquitous use of armor is a great battle-winning factor.

ARTILLERY

The gunners have risen to great heights in this war and I doubt if the artillery has ever been so efficient as it is today.

In considering the future of the artillery, it is very important that we should get the organization right, with the correct balance between tracked guns and towed guns, and so on. The expenditure of ammunition in this campaign has been tremendous, and as a result of the experience we have gained, certain facts have emerged. It has been found that a large *number* of small shells over a given time produces a greater effect on the enemy than the same *weight* of larger shells. It is, moreover, important to remember that there is a time limit for bombardment, after which enemy morale gets no lower and further expenditure of ammunition is wasted. We have found that our own casualties rise in direct proportion to the distance of the infantry behind the artillery supporting fire.

All these facts point to the need for relatively small shells for close support of infantry, where neutralization and not destruction is the immediate object. The 25-pounder meets the case; it must have good fragmentation. I would mention the fuze problem as this requires study and development. We must have a good proximity fuze and a good time fuze.

Lastly, the Air Observation Post. The Air O.P. has proved its value in this campaign. It has become a necessary part of gunnery and we must press for a good aeroplane for the job. Very good R.A. officers are required for duty in the squadrons, and they must be selected with this in view. Primarily an Air O.P. officer must be a good gunner—it is not difficult to teach him to fly.

THE ENGINEERS

The engineer problems were unusually formidable, and had to be executed at a great speed.

In the early days the clearance of beach obstacles and mines gave rise to great anxiety and called for prolonged and detailed study. The problem of placing the Mulberries or artificial ports was solved by the excellent coöperation between the Royal Navy and the engineers on both sides of the Channel. As the beachhead began to expand, we were faced with demolitions on a grand scale—demolition of ports, railways, bridges and airfields—combined with extensive and very skilful mine laying.

The repair of well-blitzed and intentionally demolished airfields, or more often construction of new ones, was in itself a major task upon which depended our support from the air.

Twin petrol pipelines were laid from Cherbourg across the Seine at Rouen, and from Boulogne stretching across the Rhine. These were supplied from ships pumping ashore, and later in particular from the famous "Pluto." (See *"Operation Pluto,"* THE CAVALRY JOURNAL, July-August, 1945.) The pipelines transported during the campaign more than a million tons of petrol.

We erected nearly 2,000 Bailey bridges, including spans across the Seine, the Meuse, the Rhine and the Weser, some of which were nearly a mile long. It has once more been shown that rivers, even very big rivers with complete demolition belts, do not hold up an army, in spite of the weight of modern traffic.

Armor and the mass of lorries assisting the Army played havoc with the roads, and the maintenance of them in conditions of continual traffic, especially in low-lying districts in severe Winter conditions, was perhaps the most heart-rending task that faced the engineers. They were greatly assisted by the Pioneer Corps, which in this task, as in so many others, did a very excellent job.

The most determined demolitions were in the ports. But we have proved that it is impossible to destroy a port so badly that it cannot be put into some sort of operation by the time the navy has cleared the mines obstructing its entrance.

The sappers were very well equipped, but it is important to remember that it is the human element—the resourceful officers and skilled and willing men—which is the major factor in engineering in war. We were often very short of sappers, particularly during the big river-crossing operations.

SIGNALS

It is fundamental that successful operations demand really efficient communications. It is therefore worth emphasizing that a commander, at whatever level, must take his Royal Signals adviser into his confidence from the earliest stages in preparing a plan.

Much of Signals' work was of the unspectacular, slogging variety which the provision of a vast network of communications involves. The constant aim of Signals was to build up the solid cable head as far forward as possible, to provide reliable jumping-off places for communications in the battle area. To serve my own tactical headquarters, which frequently moved at intervals of every two or three days, use was made of an ultra high-frequency wireless of an entirely new type (No. 10 set). This method gave me secure speech communication with my armies and my main headquarters.

I think that one of the main Signals lessons has been the necessity for insisting that the officers reach a really high standard of technical ability. Modern equipment becomes increasingly complicated and diverse, and the officers must know all about it if they are to get the best results.

THE INFANTRY

In spite of predictions to the contrary, the infantry has lost none of its importance on the battlefield. Modern infantry is a master of more weapons than ever before, and the infantryman's life depends primarily on the skill with which he uses them; he must reach an increasingly higher standard of training. It has been a war of movement; but although the infantryman may motor into battle, his training must keep him hard and tough—a point which must never be overlooked in these days of troop-carrying transport.

The introduction of the armored personnel carrier is an important innovation in the employment of infantry. It enables infantry to be transported across bullet-swept zones in order to arrive fresh at the vital part of the battlefield. The development of this technique has already gone far and done much to enlarge the scope of infantry tactics. For example, in the first major attack by the Canadian Army astride the Falaise road on August 7th, infantry carried in "Kangaroos" were moved by night a distance of five miles to their off-loading point; the last three miles of this advance were actually within the enemy positions, and the troops debussed almost on the edge of the enemy gun areas. They then fanned out to overrun the belt of country they were attacking.

The tendency to do more and more by night has been greatly facilitated by the provision of "artificial moonlight." Artificial moonlight, provided by searchlight batteries, has now become a standard part of our military organization and has greatly assisted the activities of the infantryman. It has also proved its value in the more rearward areas to the bridge builders and administrative echelons. (*See story in this issue.*)

It has again been the infantry who suffered the heaviest casualties. I cannot praise too highly the stamina and persistence which the Infantry displayed in the campaign. Divisions were called upon to remain continuously in action for many months on end. To this they responded admirably, even during the very bitter Winter we experienced.

AIRBORNE FORCES

Airborne forces must now form an essential part of the army, as there will often be occasions in which they can play a vital rôle. Apart from their participation in the battle, the threat of their use can be turned to important advantage, for experience has shown that thereby the enemy can be led to make considerable and even vital dispersions of his front line forces. This is in addition to the need to lock up troops in rear areas for guarding vital zones and installations when the opponent is known to have airborne troops at his disposal.

The use of airborne forces in highly mobile operations is limited, because the time required for planning their descents frequently results in the ground troops overrunning the projected dropping zones. But in deliberate operations, such as the seaborne assault or the assault across a major river obstacle, airborne troops have proved to be a battle-winning factor.

The threat of an airborne operation, in conjunction with other factors, was material in causing the Germans to retain major formations in the Pas de Calais during the initial period after our landing in Normandy. Nearer the battlefield, uncertainty as to our intentions, combined with the use of dummy paratroops, caused alarm and despondency to the enemy. This delayed the arrival on the battlefield of portions of his forces at a vital time.

There are a number of limitations in the use of airborne troops, chief of which is the uncertainty of weather. But I believe this factor will become less important in the future as scientific methods are developed to facilitate the use of aircraft under adverse weather conditions.

I think we must re-examine our present organization of the airborne division. I should like to see the paratroops and the glider-borne elements combined together in a standard type of brigade since, once it reaches the ground, the airborne brigade fights as infantry.

THE MEDICAL ORGANIZATION

No account of this campaign would be complete without some mention of the truly remarkable success of the medical organization. But it must be remembered that there were two factors which contributed greatly to the results achieved; probably no group of doctors has ever worked on better material and, secondly, they were caring for the men of a winning army. The men of the 21st Army Group were fully immunized and fully trained; their morale was at its highest; they were well clothed and well fed; they were fighting in a climate to which the average British soldier is accustomed; hygiene, both personal and unit, was exceptionally good; welfare services were well organized. The exhilarating effect of success also played its part in reducing the rates of sickness.

Commanders in the field must realize that the medical state of an army is not dependent on the doctors alone. Their efforts are immeasurably facilitated when morale is at its highest, and of all the factors which insure a high state of morale, there is none more important than success.

The sickness amongst troops was almost halved as compared with the last war. It is striking that, as we swept through Germany liberating prison camps such as Belsen and Sandbostel where thousands of persons were dying of typhus, only 25 British troops contracted this disease. None died of it. This was due to preventive inoculations and to the adequate supply and use of a powder called D.D.T.

Air transport has been of great importance in the evacuation of casualties. By this means over 100,000 wounded men were evacuated to base hospitals from front line units. In the sphere of transfusion, great quantities of blood and blood plasma were used. A coördinated service of air transport and refrigerator trucks insured that fresh blood was always at hand for surgeons working directly behind the lines, even during the rapid advance into Belgium.

Another interesting fact is that in the last war two out of every three men wounded in the belly died. Field Surgical Units, operating close behind the lines, greatly reduced this danger. In the Normandy campaign two out of every three men wounded in the belly recovered.

The healing of war wounds has been revolutionized by the use of penicillin. Many men, who in the last war would have been permanent invalids, were fit and ready to go back to the line within a month of being wounded.

To sum up, the doctors were prepared to lay 15 to 1 that once a man got into their hands, whatever his injury, they would save his life and restore him to health. It is a fine thing that these odds were achieved with a handsome margin.

CONCLUSION

I must emphasize that my narrative has been concerned with the 21st Army Group, but it is well to remember that any complete story of the campaign in north-west Europe would tell you more of the tremendous effort of the United States and of the fighting on the more southerly sectors remote from the 21st Army Group zone.

I would also say that the scope here has permitted only the briefest reference to our great Russian ally, but we must remember that the Russians bore throughout the greatest weight of the enemy onslaught on land.

Events have amply shown what a splendid spirit of coöperation was achieved in this war between the navy, army and air force; I doubt if such a smooth and efficient system of working together has ever been achieved before. This applies equally to the relationships between the three British Services and their American counterparts.

It has been brought home to me, not only in this campaign but throughout the war, that the soldier on the battle front and the worker on the home front are closely linked members of the same team—neither can achieve any success without the other; both have to stand firm under fire and both have to see that their job is carried on in spite of all the enemy can do.

In this war the civilian on the home front has shown the true British spirit of determination to carry on, in spite of every difficulty and every danger that the enemy could cause. If he had not done so, the soldier on the battle front would have fought at a very great disadvantage.

In conclusion, I wish to pay tribute to the splendid fighting spirit, heroism and endurance of the ordinary soldier of the British Commonwealth of Nations. Once again he has indeed proved himself second to none. And if I were asked what is the greatest single factor which contributed to his success, I would say morale. I call morale the greatest single factor in war. A high morale is based on discipline, self-respect and confidence of the soldier in his commanders, in his weapons, and in himself. Without high morale, no success can be achieved—however good may be the strategic or tactical plan, or anything else. High morale is a pearl of very great price. And the surest way to obtain it is by success in battle.

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Excerpts from Secretary Byrne's Speech, February 28, 1946

"While it is not in accord with our traditions to maintain a large professional standing army we must be able and ready to provide armed contingents that may be required on short notice. We must also have a trained citizenry able and ready to supplement those armed contingents without unnecessarily prolonged training.

"That is why in the interest of peace we cannot allow our military establishment to be reduced below the point commensurate with our responsibilities, and that is why we must have some form of universal military training."

The "Snake"

by Major Thomas W. Wood[*]

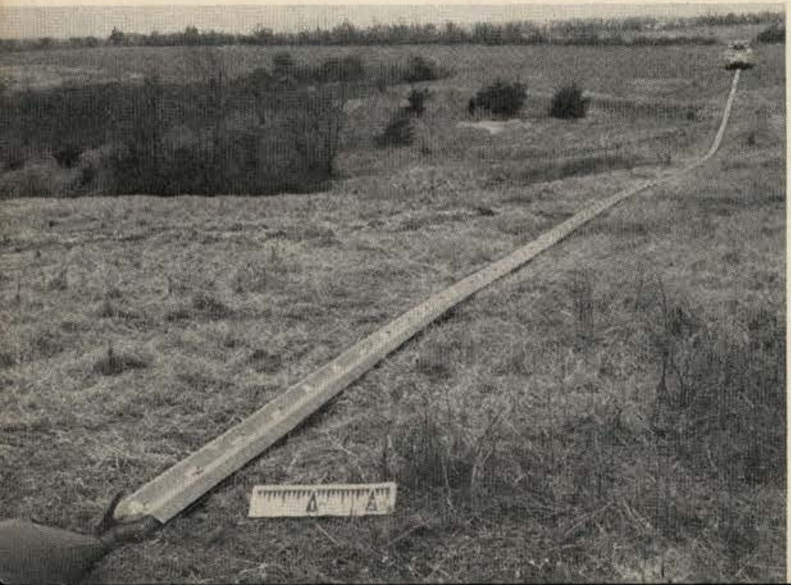
THE minefield-clearing "Snake" has been a paradox in its effectiveness and lack of use. Originating in Bangalore, India, where bamboo stalks were first filled with explosives and pushed by hand through enemy defenses to clear a safe path, the Snake is a large bangalore torpedo which is pushed by a tank.

The Snake is a long and narrow semi-rigid metal shell filled with explosives, and can be assembled in lengths up to 400 feet. It is put together in an area removed from enemy fire, towed by the tank to the edge of the minefield, then pushed by the tank into the field and detonated. The blast pressure set up by the terrific explosion of 4,500 pounds of amatol destroys all mines down its length and far enough to the sides to provide a mine-free lane through which tanks or other forces can advance. This is the only known method of quickly obtaining a completely cleared lane through a minefield without exposing personnel to small-arms fire.

In the Anzio break-through of May 23, 1944, the Allied columns of tanks, tank destroyers, and infantry advanced through two lanes blasted by Snakes across dense and deep minefields, and quickly gained their objective against a surprised enemy. Near by, in another combat command, where Snakes also had been prepared but at the last minute were not used, 30 tanks were lost when the unit made a similar advance. This attack was over ground which prohibited the use of mine detectors because it was littered with shrapnel from four months of heavy fighting.

The Engineer, AFHQ, wrote of this: "Judging from the success of the operation described, it is believed that the Snake will prove to be a very worthwhile weapon." This echoed the belief of those who had followed its development in this country and had seen it employed in demonstrations. Yet the Snake was never again used in combat after Anzio. Some of the reasons why may be found in a description of what the Snake is and how it works, as well as a further examination of the combat reports from Anzio. These may likewise show that there is now ample justification for the belief that the Snake may be "a very worthwhile weapon."

The Snake, only quick method of clearing a lane through a minefield, is shown being pushed into position by a tank.



The British recognized the need for an effective mine-clearing weapon in the early days of the war in Africa and suggested, as an answer, large bangalore torpedoes which were made by filling lengths of pipe with explosives. It was known that enough explosives in the right place would accomplish the job. The problem was to find an effective means of placing the line charge across the minefield. Actual development of a device to accomplish this was a continual compromise between providing enough explosives to detonate known enemy mines, and the many factors that came into manufacture and tactical employment, such as weight and bulk, field assembly time, special training required for personnel, hazards to friendly troops, tank attachments required, availability of critical materials, and a host of other items.

The M3 aluminum Snake, as finally developed, consists of two parallel linear explosive charges encased between corrugated metal plates, bolted together to form an assembly which can be towed or pushed by a light or medium tank. It is flexible in vertical plane to permit it to pass over rough ground, and rigid enough in horizontal plane so it will maintain a relatively true course when being pushed. The assembled M3 Snake is 14 inches wide, five inches high, and 400 feet long. It weighs approximately 9,000 pounds, including 4,500 pounds of explosives.

The explosives are contained in elliptical aluminum-cased cartridges, 5 feet long, approximately 5½ inches wide by 3¾ inches high. Each cartridge weighs 40 pounds and contains 35 pounds of amatol, an insensitive high explosive. One end contains a cap-well to receive a standard blasting cap, which is for use when and if the cartridges are diverted from their normal use in the Snake and are employed for general demolition work.

The Snake is exploded by machine-gun fire from the pushing tank against one of two impact-type fuzes. Two such fuzes are provided in case one is damaged in use or defiladed from the tank gunner when the Snake is in the firing position.

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[*] ★Corps of Engineers.

A pear-shaped nose, which allows slight movement in all directions, is connected to the front of the Snake. This keeps the end from digging into the ground, and helps guide it around trees, over ditches, etc.

Assembly of the Snake is accomplished ordinarily by a specially trained crew consisting of one platoon. In daylight, assembly time is approximately one hour after all materials are on the site; at night, under adverse conditions, the time is double. The training of a tank crew to handle the Snake requires about a week.

A properly constructed Snake can be towed for miles over good terrain without showing signs of serious weakening. It can be pushed a distance of about 400 feet in the direction in which it is headed, and must be fairly straight before the pushing is commenced.

It is advisable for friendly infantry within 250 to 800 yards to the sides or 250 to 300 yards to the rear of the Snake to take cover to avoid flying fragments when it is detonated. There is little danger to a man close to the ground, or behind any sort of cover even if he is much closer than the given distance. A man in a foxhole probably would suffer no great harm at 25 yards.

Detonation leaves a well defined crater which plainly marks the cleared lane through the minefield for the passage of tanks or assault forces.

The Snake contains 50 per cent more explosive than the famous "Block Buster" bomb, and therein lies one reason why it was used but once. To the infantryman, the tanker, and all others who do not ordinarily handle explosives, 100 pounds is a tremendous quantity. Speak in terms of 4,500 pounds, and the average listener will express disbelief that you can live within a mile of it. So it is not surprising to read in the report of the Engineer, Fifth Army—"It was noted during the (Anzio) operation that our own infantry and tank men were very much afraid of Snakes. This fear was one of the main reasons the (other) combat command did not use them. Previous to any similar operation in the future, infantry and other troops should be given special Snake training and orientation." In the operation, friendly infantry who were about 100 yards from the scene asserted that they had been "knocked over."

The present M3 Snake has been greatly improved over the steel M2 employed at Anzio. Both encasing plates and cartridge shells are made of aluminum. Now 50 per cent of the total weight is in explosives, whereas with the M2 Snake, only 25 per cent was in explosives. It is easier to assemble and it is safer to use because fragments have been greatly reduced by the use of aluminum, much of which is actually consumed by the explosion.

The improvements made are important. In a discussion of the M3 Snake with a member of the Sixth Army staff shortly before the end of the war, he stated that they intended to carry this Snake on the planned operation into Japan.

From the logistics standpoint, it is to be noted that if no use is found for the Snake in clearing a minefield, its aluminum-cased cartridges can be used as explosives. They are highly efficient packages of explosives either for assault or general demolition. Newsreels of combat scenes in Aachen, Germany, showed a streetcar being loaded with explosives behind the U. S. lines and turned loose to roll down hill into the well-emplaced Germans. Those explosives were Snake cartridges.

Designed to weave its way around or over obstacles, a Snake is shown being pushed through jungle terrain.

The impact fuze that comes with the Snake is not the only way it can be detonated. At Anzio, the troops had rigged up an improvised firing device consisting of an M1 antitank mine with a steel plate welded to the spider and strapped to the top of the Snake in lieu of the usual, similar, firing device. In the excitement, when the first burst or two of machine-gun fire failed to register on the detonating device of one Snake, the gunner fired a point-blank HE round from the tank's 75mm gun. This registered squarely on the Snake, and did the trick nicely. Perhaps the thought that an enemy gunner might also register on the Snake has been a major deterrent to enthusiastic acceptance by tankers.

As a matter of fact, 60 feet of the tail end of the Snake is loaded with sand bags and not explosives. Almost a direct hit would be required. Tests have shown that high explosive 105mm projectiles must land within one yard of the Snake to detonate it. If a Snake should be hit or detonated accidentally for any other reason while being pushed into final position by the tank, nothing more would happen to tank or crew than if the Snake were fired as intended. Should the Snake detonate while being towed, however, the tank engine might be temporarily stalled and the result would be more telling.

The forward 20 feet of the Snake is also dummy loaded. Thus, if a mine should be set off by the nose as the Snake was being pushed into position, the Snake itself would not be detonated.

To quote again from the Anzio report: "The two engineer guides . . . began leading the tank-towed Snakes from the assembly area to two gaps in the friendly minefields guarding front line positions. . . . Two Snakes had been placed in line in each gap, the leading Snakes stretching to points about 285 yards into No Man's land, the tails of the rear Snakes approximately even with the beginning of the gap. . . . The towing tanks then backed out over the Snakes and retired." To back a tank over a Snake is dangerous. The tactical situation, where the Snakes had first to be towed through gaps in friendly minefields, may have left no other alternative than to back out over them. The Snake, however, might have been set off at that time by an enemy hit or an accidental strike on the firing devices, or by the tank's getting off center and crushing the explosives hard between the metal plates. An explosion under the belly of the tank would have wrecked the vehicle and killed the crew. After towing a Snake into the position from which it will later be pushed, if at all possible the tank should give the Snake a wide berth. The recommended technique of employment calls for two tanks. Until immediately before H hour, the Snake and the two handling tanks remain under cover behind the lines. At H hour, the towing tank moves the Snake to the edge of the minefield. This can be done at a speed of about four miles per hour. This tank then cuts loose and immediately turns off to the flank. The other tank, which has followed closely behind, then engages the pushing hook and, in an operation which requires about three minutes, pushes the Snake into firing position. The pushing tank backs off a few feet and fires the Snake. The ensuing smoke and dust provide excellent screening for an immediate push through the gap.

In summary, the principal facts concerning the Snake and its employment are:

The Snake is best suited for breaching minefields in a situation that has remained static for some time, although if the supplies are on the site, it can be assembled and employed on several hours notice.

The limits of the minefield to be breached must be known, and the near edge must be plainly marked.

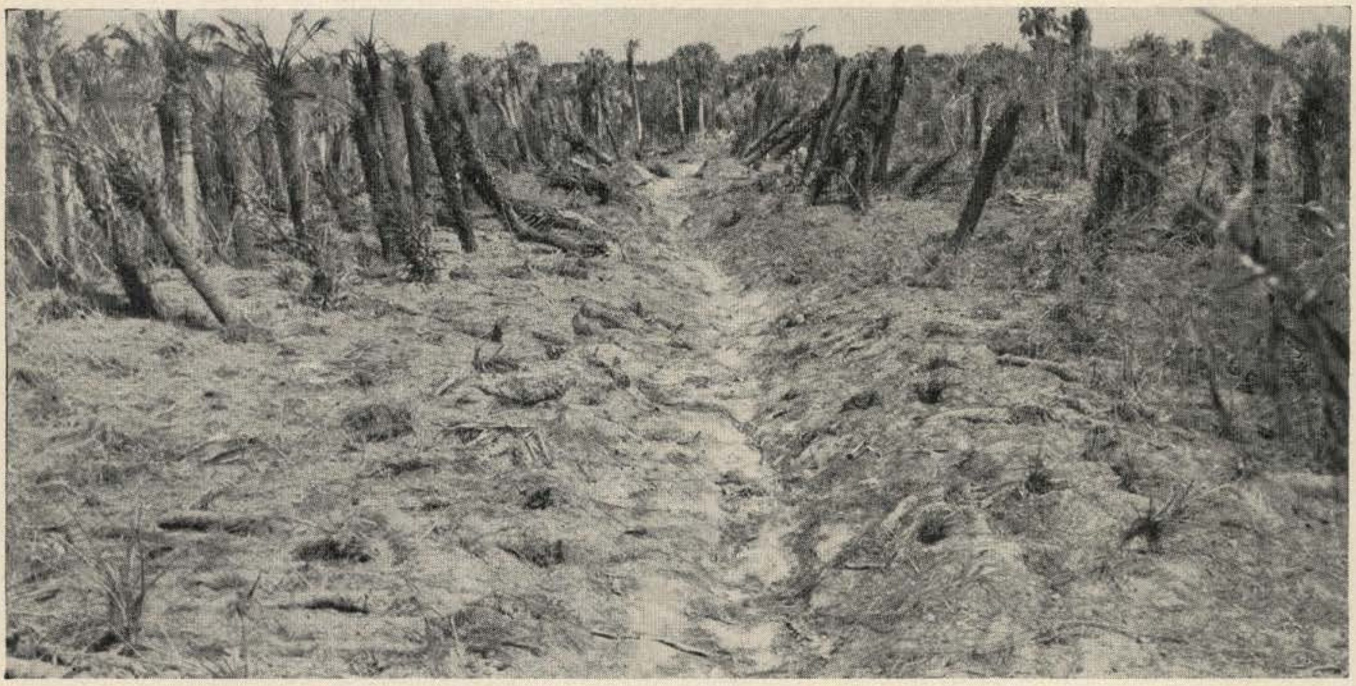
The approach from the Snake assembly area to the minefield must be suitable for bringing up Snakes.

Because of the slow speed at which the tanks handling it move, employment under cover of darkness or smoke is advisable.

Adequate Snake training and orientation must be given tankers and accompanying infantry. There is no undue hazard when employed by well-trained troops.

The aluminum Snake (M3) is light enough to warrant carrying it on an operation with the view of using the cartridges as ordinary explosives if the situation, as it actually develops, should not require the Snake as such.

Upon detonation, the Snake clears a marked path—even in jungle growth—over which troops can advance.

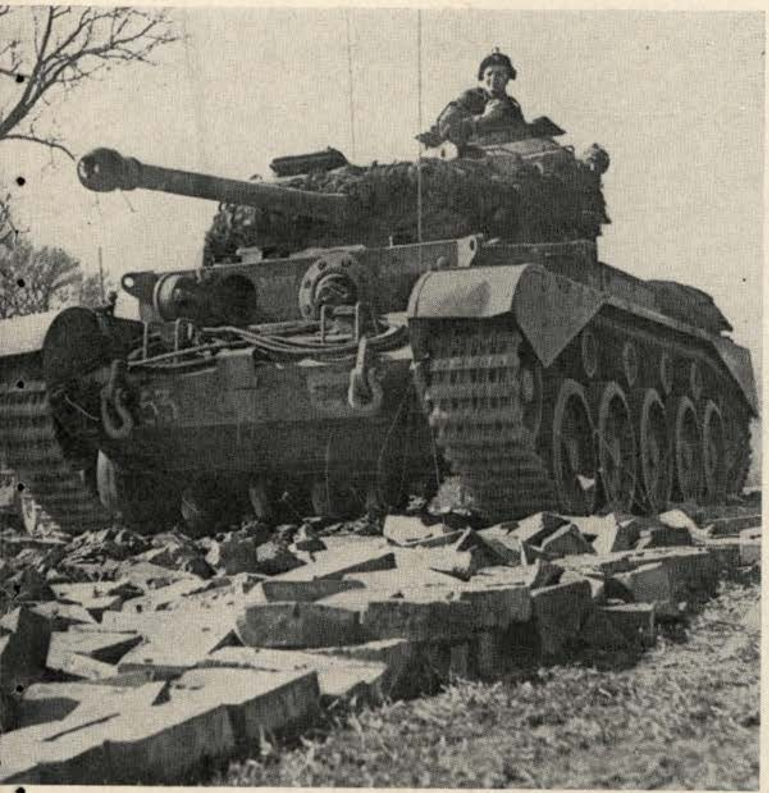


The Comet—Heavy Cruiser Tank

CARDED

by Major J. R. W. Murland[*]

After the British Cromwell tank came its successor, The Comet, more heavily armed and with thicker armor, but with no less speed. Its main armament is the new 77mm, which is carried in addition to two 7.92mm Besa machine guns. Speed is 32 miles an hour.



British Official Photo

Special devices for sighting and laying its guns are an outstanding feature of the Comet, new British tank, one of which is shown approaching the Weser bridgehead.

SOME time before Britain's Cromwell tank made its first and extremely successful appearance in action, the design of its successor, the Comet, was already well advanced. Battle reports on the Comet, first employed in March, 1945, showed that the new tank not only represented a great advance over its predecessor as a weapon of war, but had also demonstrated a similar degree of mechanical reliability—one which would have been considered fantastic a few years ago.

When the question of a successor to the Cromwell was first contemplated, the designers faced the inevitable conflict of military requirements. It was clear that the paramount needs were for a heavier armament together with thicker armor; at the same time it was considered that little, if any, of the Cromwell's great speed could be sacrificed. That this was achieved without the sacrifice of any military essential can only be regarded as something of a miracle.

BEATS THE GERMAN "TIGER"

The gun selected for the main armament of the Comet was the new 77mm, which combines a good armor-piercing quality with the ability to fire a most effective high-explosive shell. It is of interest that the armor-piercing performance was better than that of the 88mm KwK 36 gun, which was mounted in the much publicized German Tiger tank. The Comet also has two 7.92mm Besa machine guns, one mounted in the turret co-axially with the 77mm gun, and the other in a ball-mounting in the front of the hull. Sixty-one rounds of ammunition for the 77mm are carried, together with 5,750 rounds of machine-gun ammunition.

Special devices were designed for sighting and laying the 77mm and Besa turret guns, and are one of the outstanding features of the Comet. It is not possible to describe these devices in detail, but it can be said that they represent a departure from any previous practice in many respects; the methods of sighting and laying insure the greatest possible accuracy at all combat ranges, and with this equipment the 77mm is at present the most accurate British tank gun.

The adoption of the 77mm gun made it necessary to increase the diameter of the turret ring to 64 inches, which is 7 inches more than that of the Cromwell. The over-all dimensions of the Comet are also slightly bigger. It is 21 feet 3 inches long, 10 feet 1 inch wide, and 8 feet 9 inches high, and weighs almost 33 tons.

ESTABLISHED BRITISH LAY-OUT

The general lay-out of the tank follows established British design, and a crew of five men is carried. These are the driver, hull-gunner, commander, turret-gunner, and loader wireless-operator, the last three being accommodated in the turret. The turret traverse is power-driven, and has a full traverse of 360 degrees.

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[*] Fifth Royal Inniskilling Dragoon Guards.

The radio equipment in the Comet is most comprehensive. Basically, it follows previous practice, allowing simultaneous telephonic communication on two channels, one to higher formations within medium range, and the other to tanks within short range; the usual inter-communication between members of the crew is also provided. In addition to these facilities, which have been standardized in British tanks for several years, there is a further radio-telephone channel for communication with the infantry or other troops with whom the tanks may be coöperating.

In several respects the appearance of the Comet is similar to that of the Cromwell, but there are two features which prevent confusion between the two. One is the external gun mount, and the shape of the turret, which is more squat on the Comet. The other is the four rubber-tired rollers on each side of the Comet which carry the top run of the track.

The remaining suspension details follow the usual design for British cruiser tanks: Christie high-speed suspension is employed, with five large road wheels on each side; and a Rolls-Royce "Meteor" petrol engine of 600 horse power, which gives the Comet a maximum speed on roads of approximately 32 miles per hour.

TRANSMISSION AND STEERING

The transmission and steering system do not call for any particular comment; the Merritt-Brown controlled differential steering system is employed, which gives a positive drive to both tracks at any radius of turn. This system was first used on the Churchill tank, and since then it has been standardized on all British tanks. It is very compact, making it possible to accommodate the entire engine and transmission in the compartment of the hull behind the turret. Two rear sprocket wheels transmit the drive to the tracks.

The Comet was first used in action in the exploitation that followed the Rhine crossings, and it formed the equipment of the well-known 11th Armored Division in its advance from the Rhine to the Baltic. During the last 46 days of the war in Europe, the exploits of this division were continually in the news, and its progress could be followed as it moved forward through Osnabruck, Luneburg, and Hamburg. It was a severe trial for a new tank which, although severely tested during its development, was being subjected for the first time to the special strains of battle. As has already been stated, excellent reports were received of its performance and reliability.

The Comet is standard equipment in armored regiments, and it has the peculiar distinction of being the only British tank which has never been in action outside of Germany.

Artificial Moonlight*

ABOUT three years before the war a new special searchlight was accepted by Britain's War Office. It was later mounted into a tank turret and, for security reasons, called the Canal Defense Light.

There was nothing new about the principle of this particular invention, but it had certain distinct advantages over previous models. The inventors had succeeded in mounting inside the limited space of a tank turret a power unit capable of producing a light of several million candle power. This could be projected through a narrow slot to produce a flat beam, roughly fantail in shape, and later known as "artificial moonlight," which would cover a frontage of about 350 yards at a range of 1,000 yards. The light could not be extinguished by small-arms fire, although it was vulnerable to antitank weapons. It also had a flicker device, which it was claimed would dazzle onlookers and might induce temporary blindness.

During the months before D Day it was found that some of the earler claims for the light had been slightly extravagant, but that the CDL had two definite advantages worth exploiting.

First, when CDL tanks were used to light up a wide front it was possible locally to turn night into day, and thus enable the pursuit of a defeated enemy to continue throughout the 24 hours. Even if not augmented by infantry the aimed fire power of the tanks and artillery was impressive; direction-keeping during a night advance or assault was greatly facilitated, and might prove decisive against an enemy on the run.

Secondly, at night the light provided an improvement of the age-old adage, viz: attack with the sun behind you and in the eyes of the enemy.

Various American units were trained, and equipped, and went with the British-trained groups to the Continent. The Normandy bridgehead breakout went so fast that it was impossible to use CDL. At a later stage, however, one squadron joined the 79th Armored Division and by protecting the bridges and ferries from floating mines and saboteurs played a very useful rôle in the Rhine and Elbe crossings.

The CDL has never been used in a mobile rôle against the enemy, although had the special CDL tanks been available, definite opportunities for their use were presented in a number of operations. Research and development of the idea will continue, for any form of artificial illumination which can assist armor in keeping its direction and in producing aimed fire by night will surely plan a part in future wars.

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*British Information Service.

BRIEF FOR A CAVALRY COMBAT PLATOON

by Captain Stuart J. Seborer

DURING 11 months of combat in 4 ETO campaigns, our cavalry reconnaissance troop participated in only two periods of breakthrough—at St. Lo and again after the Rhine River crossing. Breakthrough operations in which the troop received a number of straight reconnaissance missions were rare. On all other occasions it was called upon to perform any mission from attacking a town to holding a sector on the Siegfried line.

"Reconnaissance" was a misnomer from the troop's point of view. We were really cavalry *combat* troops and, unfortunately, not organizationally conceived with that in mind. It was with a feeling of insecurity that the troop frequently received orders to attack dismounted (with our radio operators, drivers, and 37mm gunners) in improvised infantry fashion.

An occasional field expedient was to attach a platoon of doughboys to the troop. This helped immeasurably, but it also revealed that the troop lacked organic riflemen to perform the type of missions usually assigned to it.

The solution lies either in restricting the type of mission to be given cavalry troops, or in changing the organization so that it is better prepared to accomplish a job of average difficulty. Experience proved that the latter is more realistic, because few higher commanders can afford to hold cavalry troops for specialized missions only.

The platoon is the basic tactical unit in our army organization. Combat showed that the platoon leader usually required a squad or two of doughboys to work efficiently through towns and woods. In defensive positions, the riflemen were needed for security and patrolling. With this in mind, the following is proposed:

CAVALRY COMBAT PLATOON (PROPOSED)

	Personnel	
3 x ¼-ton Trucks	1 Officer	11 Enlisted Men
2 x Armored Cars		8 Enlisted Men
2 x Personnel Carriers . .		20 Enlisted Men
Total	1 Officer	39 Enlisted Men

PRESENT CAVALRY RECONNAISSANCE PLATOON

	Personnel	
6 x ¼-ton Trucks		18 Enlisted Men
3 x Armored Cars	1 Officer	11 Enlisted Men
Total	1 Officer	29 Enlisted Men

The advantages of the proposed organization are:

1. *Economy of vehicles.* The platoon would have 7 vehicles instead of 9. Experience showed that frequently the fight to advance becomes a fight for roads. Nine vehicles will stretch out about 500 yards along a roadway and if tanks or assault guns are attached, the column becomes longer and even less wieldy. Since the firepower of rear vehicles can seldom be employed, the reduction in vehicles is a definite advantage in making the platoon more compact, more easily camouflaged in the vehicle park, and will also save in maintenance.

2. *Control.* Under enemy fire it is difficult to form the men from several vehicles into dismounted teams. It is time-consuming and inefficient despite training and standard operating procedures. In the proposed set-up, a team which rides together in a personnel carrier for dismounted action is a part of each cavalry combat section. The importance of a vehicular team can hardly be over-emphasized.

3. *Tactical Employment.* A dismounted-mounted platoon team will be of inestimable value for the missions cavalry has been assigned. Its vehicles also are present for performing any mounted reconnaissance mission, for example: the ¼-ton as a point covered by another ¼-ton, or armored car; or the armored car as point covered by the other armored car. (One of our platoons used the latter formation from the breakthrough at St. Lo until we reached the Elbe River.)

4. *Security.* An organic squad of dismounted riflemen and BAR team in each personnel carrier would give the cavalry combat section the security it needs when in contact with the enemy. The mission of outposting a town or fortified position also would be simplified.

The proposed cavalry combat platoon provides the platoon leader with the needed organic riflemen. The practice of attaching doughboys from other units, or even establishing a rifle troop within the squadron, is not an adequate solution to this fundamental organizational problem. The basic tactical unit must have these men as a permanent part of its organization in order to accomplish the missions usually assigned to it.

Mobile Patrol Troops Stalled Four Weeks By Lack of Gas

From Stars and Stripes, January 7, 1946

by William Jordy, Staff Writer

PROPOSALS to concentrate military might in a scattering of highly-mobile Army units for the purpose of occupying the U. S. Zone of Germany may collapse for lack of gasoline, if the immobilized Troop B, 25th Mechanized Cavalry Reconnaissance of the 4th Armd. Div. is a sample of the plan in action.

Charged with patrolling approximately 80 square miles of the mountainous landkreis of Regen and Grafenau bordering on the Czechoslovakian frontier, this unit has not sent out a patrol within the past four weeks.

While half-tracks and armored cars sit in a snow-covered motor pool, the cavalrymen fill in their idleness by patrolling Zwiesel on foot, to make this tiny mountain hamlet perhaps one of the most heavily-guarded areas in the ET. The remainder of their territory goes without protection.

The same situation prevails in other "highly mobile" patrolling outfits in this area.

Protection is badly needed here, Troop Commander Lt. Thomas Jamison of Pasadena, Calif., believes, since a recent shakedown in Zwiesel netted one SS escapee, 49 persons without passes on their persons and a considerable number of curfew violations. While the misdemeanors, with the exception of the escapee, were minor, they did indicate, the lieutenant asserted, that the people were getting careless and that an occasional show of force was good psychology.

MANY VIOLATIONS REPORTED

The troop has heard of numerous such violations in the near-by town of Regen, together with threats made by German youths against certain girls who went with U. S. troops. But there is no gas to make the 11-mile trip for the shakedown.

The only other soldiers in the two landkreis "protected" by Troop B are those in two eight-man MG detachments in Zwiesel and Grafenau, a Signal Company sent to Grafenau without arms, and a scattering of GIs and officers in a few plants now under Third Army control. Troop A, whose gasoline shortage is similar to that of Troop B, is assigned to border patrol in the area.

If attacks were made on these weakly armed outfits, Lt. Jamison said, they would be wasting their time to telephone to Zwiesel for assistance.

"Of course," he added, "we might be able to hitch a ride on civilian transportation."

There is some arrangement whereby a truckload of gasoline could be rushed from 4th Armd. Div. Headquarters in Regensburg, 80 miles away, in the event of an emergency. S/Sgt. Thomas W. Carnall of Mansfield, Mo. estimates that it would take a half hour to an hour of towing before the frozen, multi-geared armored cars and half-tracks could be turned over, even with tanks full of gasoline.

IDLE CARS: FROZEN BATTERIES

Sgt. Carnall said that each of his vehicles should be run for a half hour daily. As a result of our weeks of idleness, seven batteries have already frozen, along with bone-dry fuel lines and gas tanks.

"Actually," he said, "we don't know whether these vehicles would run or not. You never know what's wrong with them, unless you can run the motors every day."

Of the 44 vehicles carried as T/O equipment by this organization, only four were operating when a reporter visited the troop. These—two six-bys and two peeps—are used solely for troop administration. The remaining vehicles are so dry that when Lt. Jamison requested Sgt. Carnall recently to line up the motor pool, the sergeant was unable to budge the rolling stock the one or two feet required to do the job.

Lt. Jamison asserts that 1,750 gallons are needed to fill his tanks, plus an additional 750 gallons for a week's operation.

At present the troop receives an allotment of 240 gallons of gasoline weekly. According to 1/Sgt. John Marker of Mansfield, Ohio, the troop breakdown allows 140 gallons for cooking, 50 gallons to operate a six-by to Cham, 48 miles away, for rations three times weekly and 50 gallons for a peep making a daily trip for mail and other errands.

When a near-by MG detachment borrowed a five-gallon can of gasoline from the troop one day last week, the troop ate a cold breakfast the following morning.

Troop B is hopefully looking forward to receiving horses.

MULES FOR CHINA*

by Captain John A. Rand, F.A.

A description of the difficulties that were encountered when 900 mules were herded 750 miles from Burma into China, with recommendations by the author as to how some of the mistakes that were made could have been avoided.

HOW would you like to be given the task of herding 900 mules on a 750-mile trip? Such a task was assigned and performed. The time—May 26, 1945; the route—Myitkyina, Burma, to Kunming, China; the purpose—to provide mules for Chinese artillery units. The movement was initiated by China, and the Northern Area Combat Command at Myitkyina was in charge of preparations.

The mules chosen were largely from the 612th and 613th Field Artillery Battalions; the remainder were selected from other elements of the Mars Task Force. All the mules had been through combat in North or Central Burma campaigns.

Personnel included two officers and sixty-two enlisted men then on duty with mules in Myitkyina, plus six officers and 130 enlisted men flown from Kunming to Myitkyina for this mission. In addition, twenty-five enlisted men were detailed from the 13th Medical Battalion. This made a total initial strength of 240 officers and men.

Preparations were hasty, as we were given the first alert on May 15th. All mules had to be shod; equipment had to be drawn and fitted, and personnel organized for the movement by May 24th. The animals were broken down into three serials of 300 each, to travel one day apart. About six officers and enlisted men were reserved for overhead supply and administration; remaining personnel was divided equally among the three serials. Each serial had one veterinary officer and three enlisted veterinary technicians; one medical officer, and two enlisted medical technicians.

The first serial left Myitkyina on May 26th, the second on May 27th, and the third of May 29th. Taking the Myitkyina-Tengchung cutoff, they crossed the China border on June 2nd, 3rd, and 4th, respectively. One day's march from there, at Kuyung, we laid over three days to catch up on shoeing, which had been impossible in the difficult mountain bivouacs we had been through, and to reconnoiter the Tengchung-Paoshan cutoff. This latter proved not to be feasible, as the bridge over the Salween River on that trail was far too high and narrow, and very unstable. Therefore we proceeded through Tengchung to Lungling and the Burma Road.

The first elements reached Kunming on July 28th, the total distance covered being approximately 750 miles. Our total marching days were forty-seven; average distance per marching day, sixteen miles.

The second serial waited at Tsuyung seven additional days to allow the first serial time for re-shoeing and veterinary processing at FATC, Kunming, before proceeding east for issue to the Chinese. When the second serial reached Kilo 51, on July 30th, transportation had broken down to the east and all serials were held in place indefinitely. The third serial never left Tsuyung.

During this delay, surra, a communicable blood disease, broke out among the mules. Veterinary personnel of CCC, SOS, and FATC collaborated in a program of testing and isolation, and it was hoped that a new drug then being developed in the United States could be procured. At this point the war ended and the problem became one of disposition of the animals to Chinese SOS. It was decided, about September 1st, to destroy all infected animals, and this was accomplished immediately. Those first serial animals which showed a negative test were distributed to Chinese Pack Artillery Battalions in training at FATC, Kunming. About September 6th, on the advice of competent veterinary officers, the Commanding General, SOS, USF, CT, decided that the remaining animals of the second and third serials should be destroyed. This was a wise decision which undoubtedly prevented a wide spread of the disease.

During the entire trip the weather was inclement, loss of feed through spoilage was often as high as 50 per cent, and marching conditions on the Burma Road were hard, necessitating constant re-shoeing and corrective hoof treatment. In the early part of the trip evacuation of animals was next to impossible.

For the first forty days the entire command lived on 10-in-1 and mountain rations. After twenty-five days I obtained some Class B funds, and was able to buy eggs occasionally. It was also necessary to buy wood for cooking and for boiling water. Shortly before reaching Yunnanyi we drew B rations, and at Yunnanyi we were given partial pay and PX rations for the first time in approximately forty-five days.

Medical evacuation was difficult, and many of the

The Quartermaster Review.

men at the outset and during the trip suffered from chronic dysentery and fevers of unknown origin. Three cases of scrub typhus occurred, and many evacuations were necessary, but there were no fatalities. Atabrine suppressive dosage was maintained, and drinking water was boiled throughout.

The men performed an extraordinarily arduous task, and are to be commended for their devotion to duty despite difficult supply problems, very hard work, and unfavorable weather and field conditions.

From personal observation and experience as officer in charge of this movement I would like to make the following recommendations in the event that such an operation should ever be contemplated in the future.

We were ordered by Headquarters in China to pack all but riding mules and load them fully throughout the trip. We made a strong objection to this, as we had not enough men to keep packsaddles properly adjusted, and I knew from personal experience that it would mean sore backs and unnecessary exhaustion for the mules, besides useless wear and tear on the saddles and a lot of extra work for the men. In the end we packed 500 mules as far as Paoshan and, in the meantime, I flew to Kunming and obtained authority to turn in 400 saddles and to draw three more trucks. Up to that point we were grossly understrength, and, as a result, skinned a good many backs and exhausted a good many men. From Paoshan on, our strength was just right, and the mules arrived at the end of the trip with clean, healthy backs. The following strength figures should be approximately correct for any future movement of this sort: If route or terrain precludes the daily use of vehicles, necessitating packing of equipment, rations, and forage, there should be two men for each three mules, and mules should be led. If trucks can be used, one man will suffice for each four mules, stripped, and mules should be loose-herded. With this method, for each 300 or 400 mules there should be three trucks and one light vehicle, and one additional truck for forage stocks not more than six days' march away. This provides adequately both for supply and for transportation of mess and horseshoeing personnel and equipment.

Until we reached Paoshan we fed Indian grain, which had suffered a large percentage of spoilage. From there on we fed native horse beans. Good quality long-forage not being available, grazing proved essential, and I think our determined effort to utilize all available grass made a great difference in the final condition of the animals. Yunnan province is made up largely of steep bare hills and rice fields, the latter taking up almost all fertile ground, and it was difficult to find decent grass. Nevertheless overnight bivouacs were chosen entirely with this in mind, and each stop afforded maximum grazing facilities unless this was wholly incompatible with reasonable marching distance or water requirements. Mules were grazed a minimum of three hours a day, loose. Graveyards afforded us more grass than any other kind of area and we therefore found it necessary to camp in them very often.

Maintenance of weight exceeded our highest expectation. At the end of the trip the average drop in weight was approximately 5 per cent, and many of the mules had gained. This may be attributed very largely to the great effort which was made to utilize grass areas.

I consider rate of march to be the next most important factor. Twenty-four miles was the longest day's march; seven miles, the shortest. Just one month out, several mules began to give out, and each day we would have to leave more men behind to bring in the stragglers. This grew to be an alarming condition. In one day we destroyed five mules which had succumbed from pure exhaustion. As the distances had not seemed too great, we decided it must be the pace, which had been six kilometers, or 3.7 miles per hour, so ordered a reduction to a maximum of five kilos, or 3.1 miles, per hour. Each serial commander was given a choice of three methods he might employ to decrease his pace by this amount. He could either march his animals more slowly; halt at the end of five kilos until the hour was up; or, best of all, halt whenever he saw a decent patch of grass along the road. These grazing halts would last from fifteen minutes to two hours, and, though we hit camp each day somewhat later from then on, the mules came in fresh and with a fair amount of extra feed inside them. This is another argument for not loading animals on a march like this. At any spot we could stop and let the mules go immediately to rolling and grazing, unhampered by loads, which would have deprived them of the rest for which the halts were intended.

The other very important factor I would like to point out is provision of suitable animal evacuation facilities. There should be a Veterinary Section camped about every 200 miles, and a number of stock trucks, approximately one per 300 mules, to work between the animal columns and the Veterinary detachments. This was not provided for on our trip, and for quite a long time we could do nothing but shoot any animal which could not immediately continue the march, when a week's rest and treatment would have put him back on the road. These trucks would also be of great help in following the animals from day to day to pick up any that were weak or mildly sick, and thus save them that day's march.

We had an adequate number of horseshoers (about one per 75 mules) and transported them each day by truck so that the minute the mules hit camp the men were fresh and could start right in shoeing. Only by this means could they keep up with the situation. It is interesting to note that we carried along over two tons of shoes, and they barely lasted the trip.

Adequate time should be allowed to prepare for such a move as this. We had less than 10 days to shoe all the mules, draw a lot of equipment, and organize personnel. The last two planeloads of men arrived the night before the trip began. As a result of this time shortage we hit the road just about half-prepared.

CARDED

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The Use of Radar in Ground Combat

BEFORE the end of the war, Signal Corps developments in radar had made possible the long-range plotting of enemy mortar and artillery positions and the detection at night of moving troops and vehicles on enemy-held roads.

Accurate spotting of enemy gun positions at ranges of more than 5 miles was accomplished through radar detection of artillery and mortar projectiles in flight. This was made possible by the use of a specially adapted Signal Corps radar to obtain accurate oscilloscope bearings on both the upward and downward paths of an enemy projectile. From these bearings, the entire trajectory of the shell was plotted and extended geometrically to indicate the exact location of the gun.

Extreme Accuracy

This type of radar had an accuracy of 20 yards in range and one-third of one degree in azimuth (direction), and could spot a hidden gun position 5 miles distant with an error of not more than 60 yards.

The radars used to detect enemy night traffic had the uncanny faculty of being able to track all moving objects in the area covered by the radar beam. These too were standard Signal Corps radars which had been especially adapted for this function.

When an ordinary radar "scans" a stretch of enemy-held road, it detects every object along that stretch of road, and the operators are unable to distinguish the enemy targets from trees, hills, and other features of the landscape. For this reason it was necessary to modify radar sets so that only moving objects would be registered.

This modification was based upon what physicists call the "Doppler effect," and because of it Signal Corps scientists knew that radar echoes would be reflected back at a different frequency from a moving object than from a stationary one. Radar was modified, therefore, to filter out echoes from stationary objects and present only data from moving objects.

With this modification, the radars could be operated much as they were in the tracking of enemy aircraft. Precise data on the range and direction of movement of the enemy vehicle were supplied by radar operators to artillery units, which used that data to aim their guns. The radar could also spot the burst of the shells in relation to the target and tell the artillerymen how to correct their aim.

Radar Ranges

Vehicular targets were detected by radar at ranges up to 16 miles, although 10 miles was the average maximum range. Individual troops were detected at ranges up to three miles, and the radar technicians became so proficient that they could estimate the number of enemy soldiers in a group and the type and speed of enemy vehicles.

Some astonishing results were obtained during the French and German campaigns. On one occasion radar data was used to inform an American patrol of the presence of a German patrol about 200 yards to their right, with the result that the enemy patrol was ambushed.

On another occasion, the radar picked up three self-propelled enemy guns which were moving forward. A battalion concentration dispersed them. At another time a convoy of 40 vehicles was picked up and artillery fire was placed on the area until all movement ceased.

During the month of February, 1945, 9 per cent of the total artillery missions fired by our forces in Germany were on targets located by radar.

Signal Corps scientists first learned that radar could detect shells in flight when they tested the first American radar in 1937. Studying the ability of the radar to automatically aim antiaircraft guns at target planes, they noticed that when the projectiles exploded near the targets they appeared as echoes on the oscilloscope.

Counter-Mortar Use

This fact was considered of only casual interest until the Italian campaign, when combat units reported that enemy mortars were causing more casualties than any other one type of weapon. The Army desperately needed a counter-mortar device, and the Signal Corps suggested radar as the answer to this problem.

Radar sets SCR-584 and AN/TPS-3 were first tested for this function. The SCR-584, an antiaircraft gun-laying set which had already proven very effective in the detection of enemy vehicles, afforded exceedingly accurate data on shell trajectories but was too big for practical front-line use. The Signal Corps turned then to its AN/TPS-3, a lightweight search radar which could be transported by plane or carried by troops to a front-line position. Equipment modifications were developed to make this set more suitable for counter-mortar use. A large tract of wasteland at Island Beach, New Jersey, was set aside for experimentation and testing of the new set (AN/TPQ-3).

Combat infantrymen with extensive mortar experience were detailed to coöperate in the tests and actual combat conditions were simulated as closely as possible. A squad of infantrymen was directed to simulate a mortar attack, with live ammunition. Orders were to select a position, fire one round, and then "move out on the double." The first time this routine was followed, their position was located by the radar within two minutes and counter-fire was directed with such accuracy that the first round landed within 20 yards of the mortar position.

The modification kit which changed the search radar to a counter-mortar radar was so designed that it could be installed or removed in a matter of minutes. Changes to the equipment included the separation of the console from the antenna to permit installation in a foxhole for the protection of the operator.

CARDED

Mental Health in Military Life[★]

Nervous breakdowns in combat may amount to as much as ten per cent of total strength. This subject warrants study by every officer.

by Lieutenant Commander Philip Solomon, USNR

MENTAL health is more than the absence of mental disease. It includes such positive elements as self-confidence, alertness, resourcefulness under fire, enthusiasm, good humor, and, in military life especially, resistance to fear—courage. Both in weapons and in men, the best materials will be useless if improperly cared for and controlled. Mental health is as important in the functioning of men as cleanliness, lubrication, proper setting of fuses and fire control are in the functioning of guns. It should be recognized that mental hygiene is as vital as physical hygiene in military life.

In the following topics, various elements that enter into the production of mental health in troops will be discussed.

Proper Leadership

Millions of words have been written about leadership, and many articles and handbooks on the subject are available. It is not the aim in this discussion to summarize, condense or select from this wealth of material, and certainly not to compete with it. The techniques of military leadership are competently taught elsewhere. It is relevant, however, to stress here those aspects of leadership which have particular importance with respect to the NP problem.

Symbolically, the leader represents the father to the enlisted man. The American boy, in general, has been brought up in an atmosphere of family democracy. The successful American father exercises his authority with benevolence, combines firmness with good will, and attempts always to make the child understand the reasons for the orders and rules. The result is a properly balanced attitude toward authority that carries over from the father to the teacher, the teacher to the policeman and so on to employers, club leaders and government officials. Leaders are expected to lead fearlessly, but always in the interests of and with respect for those led.

The officer should always keep in mind this traditional American attitude toward authority. Naturally, in the military setting there are usually limits to the amount of explaining that may be done, and often obedience must be immediate and unquestioning. But the principle may hold nonetheless.

Two common and oppositely directed failings in officers are important in considering mental health of enlisted men. The first is the overbearing commanding officer, who mistakenly overemphasizes curtness, bluster and stern discipline. Such an officer stirs up deep-seated hostility and rebellion in many men. The second is the weak, indecisive officer who vacillates and falters in the pinches. Such an officer generates lack of confidence, apprehension and anxiety.

Either reaction is damaging to mental health and conducive to NP breakdown. The officer who cannot maintain an essentially paternal attitude toward his men may be a satisfactory figurehead but never a true leader. The American fighting man wants neither to be bulldozed nor mollycoddled. He wants only a square deal.

Proper Training

Self-confidence is the antidote to fear. The value of battle-hardened troops has long been appreciated by military leaders. But thorough training can be a good substitute for actual battle. Drills, combat courses, maneuvers, live ammo fire, simulated mines, mortar fire and amphibious landings can be made very much like the real thing. Adding amplified recordings of actual battle sounds would be of additional help. Certainly the field living—mud, lack of comforts, K rations, primitive heads—can be experienced in the form of a pre-exposure which will serve to prevent surprise, disgust and revulsion at a time when such emotions would be damaging in actual combat. Those who cannot take it are best weeded out in training. Every effort should be made to send troops into combat only after they have completed the entire course. Green men as replacements are often considered worse than none at all.

Strategic Orientation

The average American is a thinking being and not an automaton. When he is asked to leave his home and his loved ones to take up arms, he wants to know what he is fighting for. He cannot be expected to do his best unless he is convinced of the vital and inescapable urgency of the Cause. A thorough indoctrination in the causes for which we are fighting should be part of the early training of every man. Material of this general nature may be offered in the form of educational movies, but they should be supplemented by group discussions under capable directors, so that the individual man may ask questions and clear up doubts in his mind.

Tactical Orientation

Not only is it of value to have the individual understand the reasons for war: he should also be made to

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[★] Condensed from article in *The Marine Corps Gazette.*

understand the reasons for the particular military operation in which he is scheduled to take part. Pains should be taken to give him as much information of the tactical situation, all the way down the line, as military security will permit. Probably the greatest advantage that American fighting men have over those of other nations is their aggressive resourcefulness under fire. The way to capitalize on this is to let every man know as much as possible of what is in the wind. Then, in an emergency, he will be better able to fend for himself and perhaps improvise a way out of his difficulty. He will also have greater confidence in himself when he knows that his leaders are willing to trust him.

Rewards

Men do things for many reasons. One of the most universal and most potent of reasons is the desire for reward. In military life, the judicious use of rewards can serve as a powerful agent toward the preservation of mental health.

Rewards may occur at various levels. Perhaps the highest is the reward which a man gives himself—the inner satisfaction of a job well done. This spiritual or philosophic level is the proper concern of the chaplain, and in military life its influence is great. The line officer enters a somewhat lower level. The valuable reward which he may distribute is a well-merited word of praise or appreciation. A sincerely spoken "Good Work!" from his commanding officer can raise a man's spirits for days. Equally important, though less frequently applicable, are letters of commendation, citations and decorations.

At a more material level, reward in the form of a promotion raises a man's ego, epitomizes progress, and what is more significant to many men, means more money. Contrariwise, the lack of promotions, or slow rate as compared with other branches of the service causes resentment and bad feeling.

Further on down the scale, furloughs and liberty time are highly treasured. Again, a liberal policy toward the deserving will pay dividends in greater efficiency, less disciplinary action and better mental health. Comfort items, such as those distributed by the Red Cross, movies, canteens, and the like, are greatly appreciated by the men. They should be made more readily available for the fighting men on their returns from the front, rather than the special prerogative of rear area troops as is all too often the case. This would decrease the hostile feelings held by front-line troops for those in the rear, and would help make them feel, as they should, that they are the cream of the crop.

Finally, at the end of the line, are punishments. Undoubtedly, the threat of punishment is a deterrent to wrongdoing for many men. But threats must not be overdone. Punishments, to be effective, should be swift, sure, scrupulously just, and meted out with full consideration for all attendant circumstances. It is noteworthy that those outfits with the best leaders generally have the fewest disciplinary actions. The desire for approval is far healthier than the fear of disapproval.

Proper classification and assignment.

An attempt is made to place every man in the job he is best fitted to do. Unfortunately there are serious limitations involved. There is need for only a certain number of clerks, carpenters and plumbers. On the other hand, large numbers of riflemen must be provided to do the actual fighting.

There has been bitter criticism that only the flower of our manpower is chosen for "cannon fodder," that the unfit, who could more easily be spared by the nation, are rejected. This is an ironical necessity of warfare. In this connection, attention should be drawn to the widespread error of underrating the requirements for first-class front-line troops. There has been too general a tendency to use "riflemen" as a dumping ground for the leftovers after other jobs have been filled. Every experienced line officer knows the enormous difference between skilled troops and a group of ineffectuals.

Unquestionably, there would be fewer NP crack-ups in combat if the need for a well-integrated personality and mature emotional stability were recognized in combat troops. Just as candidates are screened before they come into the service, they should be screened again most carefully before they are sent into combat. The immature, the unstable, and the dull-witted, to mention but a few, should be kept in rear areas.

Men generally do best what they wish to do. Of course, the military needs must be considered first, and many men will feel they are misrouted. When this is true, their attitude will improve greatly if they are given the benefit of an explanation. They also should be made to realize the importance of routine, uninteresting jobs in war. It bucks a man up to think that what he is doing is important. It sometimes helps to explain to men the fundamental and necessary unfairness of war —the unequal distribution of risks, of awards, of inevitable waste.

Officers are sometimes troubled by the "8-ball," the man who is as helpful as a sore thumb. Such a man is often palmed off onto others as the simplest solution. On occasions this helps, since the man may just happen to find the particular niche where he can get along. More often the problem is aggravated. Misclassification or misassignment may be the cause, and it may be helpful to consult the classification officer. If this fails, the case should be referred to the medical officer, or psychiatrist.

Group Spirit

Man is a gregarious animal. He prefers to share both his pleasures and his dangers with other men.

Experienced officers are familiar with the value of team spirit. At its highest level it is called patriotism and constitutes a sustaining driving force in time of war. It is equally important at lower levels, in loyalty and devotion to the corps, division, regiment, battalion, company, platoon, down to squad and tent-mate. A man will stand and fight for his buddy when he might run away by himself. The cohesive strength of the group, the knowledge that he is not alone in his trouble, will hold a man to his post when all hell breaks loose. This fact must be utilized to the limit in a military organization.

The same group of men should be kept together as much as possible, from their early training on into actual combat. Their pride in their outfits should be encouraged in every way. Officers should be sensitive to this group spirit, take part in it and exploit it to its fullest. When replacements are added to an outfit, they should quickly be indoctrinated into the feelings and traditions of the group.

Other Considerations

No man can be easy in his mind, or put his whole heart and soul in his work if he is worried about conditions at home. Every effort should be made to keep strong the one tie that still binds a man to his home—the mail, all conceivable priority should be given it. Up-to-date news, when it can be provided, is also a boon.

In cases of individual family problems a talk with his officer or the assistance of the Red Cross worker or chaplain may be of great value to the man in trouble.

Nothing is so conducive to high spirits and fresh energy on return to work as an interesting and vigorous sports program. But recreation does not stop at athletics. The movies, at which the soldier can forget himself and the war for a few hours, are a great source of entertainment in every theater of operations. Enlisted men's clubs, Red Cross activities, table tennis, bowling, libraries, game rooms, music, USO shows, hobbies and well-stocked PXs vary in applicability on the military situation, but each in its place can add tremendously to the happiness of the men.

Religion plays an important role in the life of the fighting man. Through religious services he can learn as in no other way the ultimate goals for which the war is being fought. A man also gains a feeling of security and confidence from prayer and his faith that he is not alone. Religion in the field is seldom generated by fear. Rather it is sincere, deep-seated, inspiring and a powerful source of mental health.

Religious observances also are of value as a continuation of accustomed civilian practices, they constitute a strong connecting tie with home and all that home signifies. It goes without saying that every effort should be made to permit men to attend religious services as regularly as possible.

A Fallacy

It is easy to fall into error when dealing with psychological matters. Psychologists themselves do it frequently. Military men would do well to keep their feet on the ground and avoid theoretical speculations in the matter of the mind.

Griping can serve as a healthy safety valve to let off steam. However, if griping reaches serious proportions, the officer would do well to investigate. A man-to-man talk with a few of the offenders may be an eye opener. Perhaps something is really amiss and needs to be set right. In any case, the men will enjoy the chance to get a load off their chests and in many instances will be able to face unavoidable annoyances more calmly afterwards.

Just this sort of attention on the part of officers for their men engenders fierce loyalty "when the chips are down."

Normal Reactions in Combat

Military combat is probably the most abnormal life situation to which large groups of human beings are forced to be subjected. The stresses are rarely duplicated, even in part, in normal living, and are never continued over such a prolonged period. Foremost is the ever-present danger of death or mutilation, the necessity to kill or maim the enemy, to destroy his stores and possessions, to live under conditions of physical hardship, overexertion, extreme fatigue, and often inadequate food, water, sleep or shelter.

A word should also be said regarding the truly remarkable powers of the human body to withstand such maltreatment as occurs in battle over prolonged periods. The ability of the body to adjust to the most trying of circumstances, the latent power and endurance which lie within it are always surprising when the crucial test arrives. When it seems as though exhaustion has reached its utmost, the stimulus of danger or extreme emotion may yet result in a supreme effort and a sudden resurgence of reserve strength.

Mental Health Required

Probably the best defense against combat fatigue is a high state of robust mental health. In actual practice, two regiments in the same division, undergoing the same degree of combat (as indicated by duration and number of killed and wounded in action) may suffer widely different numbers of combat fatigue casualties. The crucial determining factor is the morale of the men, and when the chips are down, morale depends more on good leadership than on anything else. It is the demoralized troops that break down in combat. "Demoralized" means loss of morale.

In any type of warfare, the amount of combat fatigue will depend to a considerable extent on the skill with which the specific causative factors of nervous disorder are avoided. Frequent rotation of troops in the front lines will result in great gains with respect to mental stability and efficiency. When the character of the operation makes this impossible, it still helps enormously if the men can be given some idea as to when their ordeal is likely to be over. The greatest emphasis on providing adequate food, water, and other supplies, including mail, is of course of utmost importance. And the leader must preserve an atmosphere of optimism and good cheer. Nothing demoralizes so much as defeatism.

CARDED

German Science in the War*

by Colonel Leslie Simon, Ordnance Department

Condensed by Cpl. I. E. Segal from Part XII of "Report on German Scientific Establishments" *by Col. Leslie E. Simon, Director of the Ballistic Research Laboratory, Aberdeen Proving Ground, and based on information obtained by Colonel Simon on his tour of Germany during the Summer of 1945.*

It is remarkable that with a very much smaller potential source of research and development personnel, the German government succeeded in maintaining a line of war weapons that were at least comparable to those of the Allies. Considering the changing conditions of warfare, and the period of time, that was a tremendous accomplishment. A few of the outstanding achievements were:

1. An extensive understanding and thorough utilization of hollow charges.
2. A good series of artillery rockets.
3. An understanding and utilization of solid- and liquid-fueled rockets and guided missiles.
4. The use of tungsten-carbide cores in projectiles.
5. Jet and turbo-jet engines.
6. Good anti-aircraft fire control, both optical and radar.
7. Low-velocity, large-caliber automatic cannon for aircraft.
8. Guns of excellent ballistics, particularly the 75mm high-velocity gun and the 88mm series.

With regard to what might have happened if the war had lasted somewhat longer, such a question is always subject to partially undecidable considerations, but some of the obvious threats were:

1. The "V" weapons. A survey of the status of these weapons indicates that they may have an important part in any war of the future, and that geographical remoteness may greatly decrease in or entirely lose its significance.
2. The flak rockets. The theoretical problem of guided missiles was solved, that of "homing missiles" practically solved, and the practical application well under way.
3. The 5.5cm aircraft rocket. This was a result of probability considerations, and only experimental production was in progress. It was stated that six ME262's (turbo-jet fighters), equipped with these rockets, shot down 14 fortresses in a single mission.
4. The P1102. A new very fast turbo-jet-engined Messerschmitt, with swept-back wings to reduce air resistance.
5. Long-range finned missiles shot from guns.
6. Short-range, long, finned projectiles of very great explosive capacity shot from conventional guns.
7. A super-rocket designed to go from Germany to New York in 30 minutes and which carried a pilot for part of the way.
8. Aircraft with the speed of sound.

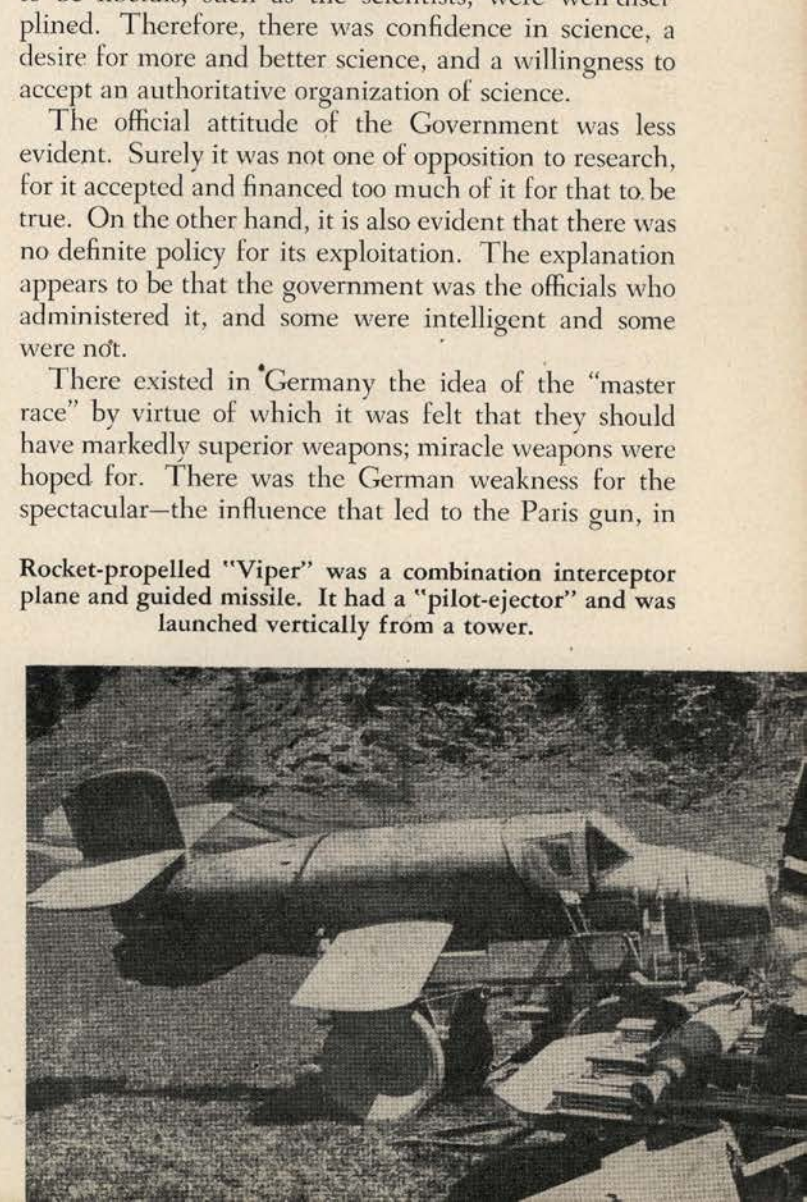
Both psychologically and materially, Germany was well prepared for a sound organization of war research. The German people were marked by a high degree of intellectual self-esteem; they felt that they were an industrious and intellectually proficient race, and that each and every one of them was in a favored position to contribute to scientific effort. In addition to this attitude, which had encouraged a supply of scientists, the Germans had excellent instruments and mechanical work, for which they are noted.

The German attitude of mind was one which invited organization in every phase of life. There was no antipathy to regimentation, and a great respect for constituted authority. Even people whom one might expect to be liberals, such as the scientists, were well-disciplined. Therefore, there was confidence in science, a desire for more and better science, and a willingness to accept an authoritative organization of science.

The official attitude of the Government was less evident. Surely it was not one of opposition to research, for it accepted and financed too much of it for that to be true. On the other hand, it is also evident that there was no definite policy for its exploitation. The explanation appears to be that the government was the officials who administered it, and some were intelligent and some were not.

There existed in Germany the idea of the "master race" by virtue of which it was felt that they should have markedly superior weapons; miracle weapons were hoped for. There was the German weakness for the spectacular—the influence that led to the Paris gun, in

Rocket-propelled "Viper" was a combination interceptor plane and guided missile. It had a "pilot-ejector" and was launched vertically from a tower.



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*Firepower.

World War I, which certainly could not have been expected to affect the military outcome—which was undoubtedly a large part of the motivation of the "V" weapons. In short, relative to the exploitation and organization of war research, the Government was willing but not intelligent.

Nearly all German research during World War II was war research. In order to procure supplies or apparatus, a war necessity had to be shown. In the interest of survival, research agencies sought in every way to connect themselves with the armed services, and exploited every avenue of contact, considering it unsafe not to advance their war-necessity status. As a result, research agencies tended to become enmeshed in a complicated net of contracts and affiliations. But research was regarded as the chief means of devising new weapons which would be sufficiently powerful to enable Germany to escape defeat by enemies who were superior both in numbers and in equipment.

Despite the fact that most research agencies were serving several offices, that the various offices exercised varying degrees of control over a number of agencies, and that each research problem was often of interest to a group of offices, the general character of research organization was not extremely complicated. In fact, this overlapping of functions, controls, and interests may not have been harmful. The end product of research is itself so uncertain, and new knowledge is potentially of interest in connection with so many fields, that more rigorously defined avenues of responsibility and authority might have retarded the dissemination of information (which was already considerably hampered by security regulations) and the exchange of scientific information.

The German Air Force had not only the most extensive research facilities, but also by far the most effective and competent organization and personnel. The extensiveness of its research facilities may be partly accounted for by the fact that the Air Force was an agency predicated on new things, and it felt a great affinity for and confidence in the new. On the other hand, the competence of its research and the quality of its personnel are probably attributable to the conditions of research which it fostered. It was hampered by neither an old organization nor a tradition. It built a series of modern research establishments to which it gave exceptional autonomy, and which reported freely and directly to the Air Ministry. In addition to these establishments of its own, it also exploited the academic institutions and the research establishments of the great industrial firms.

The German Army, however, had only a single quasi-military research agency of its own. Like the Air Force, it had contracts for facilities of the academic institutions and firms. Its research was all reported through an office only coördinate with the offices of the development divisions. But the real control of its research and development was in the hands of the manufacturing firms. Likewise, it appeared from any brief investigation that weapons of the German Navy were extremely dependent upon the great manufacturing firms.

The organization of German Air Force research, which was very largely due to one man, Baeumker, incorporated fundamental principles known to men of science but seldom seen in practice outside a few laboratories. The research unit was not too large (perhaps 50 to 100 men) and the research structure was based on the institute. Unscientific interference into the institute was avoided by having it report only to the highest authority for some loosely held powers of coördination and administration which were delegated to intermediate authority.

The importance of congenial social status and comfortable living conditions to the successful and vigorous conduct of research was recognized. Scientists were accorded a place of distinction; it was made possible for them to live in groups; their research buildings were spacious, dignified, well-furnished, and pleasantly situated. Finally, the salaries of the scientists were high, by German standards, though not as high as industrial salaries. It was manifest that these conditions could not fail to have a beneficial influence on the quality and quantity of scientific output, not from the viewpoint of pampering the scientist but from the purely materialistic viewpoint of removing interferences and irritants that would decrease or stultify the flow of ideas.

There were also psychological and physical factors that inhibited the successful functioning of the German scientific organization. There seems to be a sort of idiosyncrasy of the German mind that may be a compensation for its meticulous methodology and studied efficiency. It might be called "susceptibility to error." It is characterized by a carefully laid plan, worked out with infinite detail, except for one vital and missing part. Having done so much so well, the Germans often made a simple mistake which was ruinous to the total effect.

The major error in the conduct of German scientific war research was a case of just one vital and logically obvious element left out of a perfectly magnificent scheme; and both the military and the scientists were partly responsible for it, although the major responsibility rested with the scientists. The major error was simply this: the scientists tried to do research to fill a need when demand was made by the military or specifically by a ministry.

It is somewhat natural for the scientist who is rather separated from military planning to say: "I know my science; tell me what you want, and I will try to get it." However, anyone who is familiar with research knows that it simply cannot be done that way, except rarely. Research takes time.

In summary it may be said that science succeeded in almost everything scientific, acquired a magnificent research organization, produced much that was useful, and failed miserably on a directive feature that would have made its work many times more powerful.

CARDED

The Soviet Art of War*

THE war between the Soviet Union and Germany ended in a defeat for the enemy greater than any known to history.

The chief events of the war, including the decisive battles of 1944-1945, took place on Soviet soil. The German supreme command constantly stressed the paramount importance of the Eastern Front, and on several occasions transferred troops there from the West.

The Soviet success in the struggle against all the might of Germany's war machine is explained in a considerable degree by our superior theory and art of war.

The highest degree of skill was attained by the Red Army and its commanders during the war, for they constantly analyzed and learned from their rich experience. It must be strongly emphasized, however, that the fundamental principles and the theory of tactics were developed, long before the war began, on the basis of study of the First World War, the Civil War of 1918-1920 and other wars which took place between the First and Second World Wars.

There is no doubt that the early successes achieved by the Nazi armies in the war against the Soviet Union are only to be explained by the temporary superiority which Germany secured by her treacherous and sudden attack on the USSR.

The USSR was able to overcome the difficulties of the first period of war and assume the offensive for the final defeat of the enemy because she depended not only on her tremendous reserves of manpower but to an even greater extent on huge quantities of armaments, first-class in quality, which the industries of the Soviet Union supplied to their Red Army.

The Soviet art of war, the war doctrine of the Red Army, was built up under the direct guidance of such brilliant authorities as Lenin, Stalin, M. Frunze, one of the greatest of the Red Army's early generals, and others. Generalissimo Stalin directed the most important operations of the Civil War and stood at the head of the armed forces of the USSR during the Second World War.

The main theses on which the Soviet art of war is built up, the methods of conducting operations, types of maneuvers, activities in the main direction by large striking forces, the maintenance of supplies for operation, the building up and employment of reserves, and many other points were laid down by Stalin in a number of his prewar works based on a brilliant analysis of the experiences of the Civil War and First World War.

These theses, which were extensively employed by Stalin with such good results during the Civil War, formed the basis of *Red Army Regulations (1936)* and have not yet become obsolete. The main point in these regulations covers most of the typical features of modern warfare—operations in great depth, the growing importance of artillery, tanks and aircraft, and methods of employing them.

The regulations, correctly assessing the growing strength of modern defenses, lay special stress on the importance of effecting a breach in strong previously built defenses, in depth. No less important are the offensive operations planned in the regulations for definite objective operations employing movement and complete encirclement of the enemy.

It will be remembered that many of these Red Army regulations were used in their entirety by the Germans for their own rules and regulations (especially on the use of tanks and airborne troops), and, also, by the Japanese who in the last edition of their field regulations copied a number of points of the *Red Army Regulations (1936)* almost word for word.

The Red Army made a thorough study of the experiences of the past, but studied them from a creative viewpoint, taking into consideration constant changes in technical equipment, and tried, as far as possible, to foresee the characteristic features of the future war.

From the standpoint of theoretical knowledge and training of regular officers, the Red Army was not taken unawares by the Second World War. From the very outset it did not meet with anything that was staggeringly new or unexpected. The Germans, despite the treachery and suddenness of their attack, did not surprise Soviet troops with anything new in the way of operations or tactical methods. On the contrary, the methods used by the German staff were extremely stereotyped on the whole.

The Soviet war against the German aggressor developed on a scale unknown in history, both from the viewpoint of the number of men and machines participating and from the viewpoint of the problems that the Red Army had to solve for the purpose of speedily defeating and destroying the enemy's fighting forces. In view of this the Soviet Command reviewed while the war was in progress a number of these from the *Regulations* concerning the conduct of operations under new conditions.

These were such items as: the planning and conduct of simultaneous operations on a wide front embracing groups of armies and several fronts for the purpose of defeating the enemy's main strategic forces; questions of conduct of continuous offensive operations to a depth of 250 to 300 miles without a lull or a halt; and questions of organization of maneuvers to surround enemy forces, which was only fully developed during the Second World War and became the Red Army's chief method of conducting offensive operations. The problem of frontal attack was extensively developed.

From a narrow use of maneuver to force a breach only in the enemy's tactical depth, the Red Army progressed to the striking of such frontal blows as would split the enemy's operative defenses to a depth of anything up to 300 miles.

The question of the use of artillery was very widely developed, as well as that of employment of tanks and aircraft in modern battles; and the use and cooperation of all branches of the armed forces in depth in defensive and offensive operations.

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*By Major General Nikolai Zamyatin, *Soviet Information Bulletin.*

Artillery Offensive*

by Engineer Colonel Pavel Zverev

IN the years preceding the Second World War, military minds were as much occupied with the problem of a break-through of fortifications as with the mass employment of tanks and aircraft. This was dictated by the experiences of the First World War and the tendency to build such powerful fortified areas to protect borders as the Maginot, Siegfried and Mannerheim Lines. In addition, the development of fortifications showed that the construction of field defenses would also be based on the principle of many-lined fortified areas.

These forecasts were confirmed in the majority of Red Army offensive operations during 1942-1945, which invariably began with a break-through of the German defenses. It should also be borne in mind that the farther the Germans were forced westward, the stronger their resistance became. But now that the powerful East Prussian defenses have been shattered, the dozens of fortifications situated between the Oder and Berlin have been overcome by Soviet forces, and under the blows of Allied armies the Siegfried Line collapsed, we may draw the indisputable conclusion that the problem of blasting fortified zones has been solved.

Considering the experience of the Red Army, we may assert that this solution was reached in a new way by the artillery offensive.

There are examples in the First World War where the concentration of artillery was not far below the average of this war. But there can be no comparison in the results achieved in the First and Second World Wars. In those days with the pounding of the enemy's defense zone continuing for days, the break-through operation was protracted and therefore did not yield the desired result, whereas now, as displayed by the Red Army artillery, the preparation continued for no more than 90 minutes or two hours, but the quality of fire was so highly superior that tanks and infantry negotiated the main defense lines in a single day. This was achieved not only by an increasing density of fire, but also by a skillful conduct of barrage—a tactic in which Soviet gunners have reached perfection.

In spite of the fact that in a majority of cases the number of Soviet artillery regiments on the sector of the break-through highly exceeded the number of infantry regiments, the artillery never hindered the operations of the infantry. On the contrary, its fire was completely subordinated to the objectives of the infantry.

Artillery offensive was composed of three main periods: artillery preparation, creeping barrage, and shifting fire deep into the enemy's defense zone.

The first stage is the most intensive, for it engages all the guns in a simultaneous action on the sector of the proposed break-through

An original interesting example of the organization of artillery preparation was provided by the Army of the First Ukrainian Front when German fortifications on the Vistula south of Sandomierz were blasted in January 1945. The main feature was that as a preliminary to the offensive, a short sham artillery preparation was started with only one-tenth of the available guns in action, and a feint attack was begun by a few battalions. The Germans mistook this for the real thing, bringing in all the forces at their command, and the attack was easily repulsed.

But soon the Soviet artillery, 250 pieces for every kilometer of the front, began again to pound the enemy. The barrage went on for over 90 minutes and was so effective that Soviet tanks and infantry made a wide gap in the entire depth of the enemy's defense zone.

Referring to this battle, Colonel Schtresner wrote in his diary: "The Russian artillery fired with amazing precision. In a matter of 15 minutes, communication was completely disrupted. I could not raise my head at the CP. It was quite impossible to direct the operations of the regiment. All my units sustained heavy casualties from gunfire. Those who survived, scattered."

It would be a mistake, however, to think that this was the only method used during the preliminary bombardment. There were hundreds of variations.

But no matter how effective the preparatory barrage may be, there always remain enemy firing points capable of inflicting heavy casualties on the attacking force, or even of checking the advance. For this reason the importance of artillery fire becomes even more significant when the attack is finally launched. If during the period of preparation the fire of each gun is directed to a certain target, then with the attack in progress the batteries can move their fire in strict coördination with the movement of the infantry and tanks.

The change of depth of fire is accomplished either by concentrated action or by setting up a barrage, or by combining the two. But whatever the method employed, Soviet infantry and tanks always moved just ahead of the creeping barrage and crushed every resistance. This wall of fire accompanied the troops for approximately 700 to 1,000 meters from the enemy front-line defenses and continued for about 30 minutes. That brought the second stage of the artillery offensive to an end, and then followed the third period.

This division of the artillery offensive into periods is theoretical, of course, for artillery fire was constant. While the wall of fire was being shifted from the first to the second trench, regimental and antitank guns had already begun to move forward and, following in the ranks of the infantry and firing direct, they silenced

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*Courtesy *Information Bulletin*, Embassy, U.S.S.R.

the surviving firing posts, knocked out counterattacking tanks or infantry parties of the enemy. Immediately afterward divisional artillery went into action.

Under this method of organization, the Soviet infantry always had the support of the artillery. Every enemy attempt to counterattack was frustrated by the concentrated fire of the divisional and corps artillery.

At the beginning of an offensive the artillery pounded the enemy defense zone to a depth of 8 or 10 kilometers, but with the advance of the infantry the fire zone naturally diminished, while the number of guns in action remained unchanged. This enabled the attacking force to deal ever stronger artillery blows and retain the superiority of fire power.

The long range of the corps and Army artillery groups, the mobility of the regimental and divisional guns, enabled the gunners to concentrate fire on the entire tactical depth of the enemy's defense zone. This paralyzed resistance, and thus solved the problem of successfully blasting a fortified zone.

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CARDED

Proximity Fuze Played Vital Role in Defeat of Axis

CHRISTMAS DAY, 1944, had been selected as the date for the first presentation to the enemy of the VT radio proximity fuze, but when the Germans launched the Ardennes offensive plans were immediately changed and the fuzes were committed to battle.

U. S. artillery projectiles, fitted with the pint-sized fuzes which caused the projectile to explode when it was within 70 feet of its target, helped halt Von Rundstedt's offensive. It vastly multiplied the lethal effect of interdictory and harassing artillery fire, and was considered secondary in importance only to the Atomic Bomb.

Use In Rockets

The VT fuze also was employed in the Army's airborne 4½-inch rocket. Extensive tests demonstrated that one out of two VT-fuzed rockets, fired from a fighter plane, could be counted upon to bring down an enemy airplane at ranges up to 1,000 yards. Since the usual fighter plane normally carried six 4½-inch rockets, this meant that a single plane would be able to account for three enemy planes on each mission.

Another use of the VT-fuzed rockets was upon gun emplacements, enemy personnel in foxholes, or airplanes parked in revetments. Tests showed a twenty-fold increase in the number of casualties for the VT, as compared with the results obtained from a rocket which was fuzed to detonate on contact with the ground. Rockets equipped with the VT fuze detonated just above the target, and blanketed the immediate area with a hail of high velocity fragments.

Mass Production

Mass production of the fuzes for airborne rockets was started in the summer of 1942, and by the middle of 1943 nearly a million had been stored for use in the event the enemy ever again threatened to regain control of the air.

Sufficient fuzes had been manufactured for their employment in combat by January 1, 1944, but their general use was temporarily withheld in deference to the safety of Allied aircraft.

The high degree of secrecy which the VT project called for made it necessary to avoid the normal channels of supply. It was therefore necessary to transport great stocks of the fuzes to isolated and well-camouflaged depots in the British Isles, France, Italy and to bases in the Pacific.

Training of Personnel

After the problems of supply had been solved, it next was necessary to indoctrinate artillery personnel with the peculiarities of VT. A detachment of technically qualified officers and men were trained in VT development laboratories, and then sent to theaters of operations throughout the world. Nearly 200 of these newly trained specialists went to Europe and the Pacific.

The first of such teams embarked for England in March, 1944. Its mission was to aid theater personnel in maintaining security, to expedite the movement of supplies, and to indoctrinate ordnance and artillery personnel in the technical nature of the fuze.

Both U. S. and British Army personnel were taught to shoot VT-fuzed shells in such a way that maximum effectiveness would be obtained. The results now are well known. The destructiveness of antiaircraft fire was increased at least five-fold. London was saved.

CARDED

Universal Military Training[★]

by Colonel W. A. Graham, Retired

TWICE during a generation the power of the United States has tipped the scales in global war. Each time—by lucky circumstances—we have been afforded time to marshal our enormous strength for battle.

This breathing spell cannot reasonably be hoped for should World War III ever break out. Modern war has sharply increased the length of time needed for preparation. In World War I, 17 months elapsed between the declaration of war and the first major U.S. offensive. There were 30 months between the sneak attack on Pearl Harbor and D Day.

The one and only sound argument against universal military training would be to demonstrate convincingly that the national security does not require it. If the United States could always be sure of enough time to enact the necessary legislation and to train and equip an army for the field, there would be no need of such a program. The ever-growing threat of amphibian operations and of long-range air attack, however, has made it almost certain that the next powerful aggressor against world peace will strike at us first—if we are unprepared.

The argument that volunteers will suffice has been proven false. Experience shows that, for various reasons, the great majority of eligible men will not enlist, and the patriotic and adventurous who do have never exceeded more than 12 per cent of our military needs. In World War II nearly 14,000,000 Americans were required for the armed forces.

Many opponents of universal military training have claimed that it will endanger the ideals of democracy. What is meant by this rather vague assertion is not clear, unless it be that submission to military discipline for a year might tend to weaken individual initiative. Was this true in the North and South after 4 years of civil war? Did the 4,000,000 men of 1917-18 lose their democratic ideals? Have the 14,000,000 who bore arms in World War II lost their individual initiative? These questions are best answered by the veteran's support of a program for universal military training.

The conclusion that military training would inculcate the so-called martial spirit in the United States does not appear to be justified. Many school boys are compelled to take courses in manual training but the schools cannot be accused of fostering an army of carpenters.

Certain educators have voiced a protest against the inevitable interruption of school and college life. Granting that some such interruption would occur, one short year seems a small contribution to the cause of national security when loss of life, of family, of home, and even of country, may be the price of unpreparedness. It is the duty of every man to provide for the common defense of his country.

The need for a universal military program is as old as the Republic itself. It was evident in Washington's day, when he said: "If we desire to secure peace it must be known that we are at all times ready for war." It was even more obvious in the last days of Franklin D. Roosevelt, when on the eve of the San Francisco conference, he said: "Universal military training is requisite to our national security."

In 1792 the Congress wholeheartedly endorsed compulsory military training. It was, however, imposed on all men between the ages of 18 and 45, rather than only on those youths who met the physical requirements. The enforced absences of the older men from their various employments would have disrupted the economy of the nation, but the old Militia system served to demonstrate that the principle of universal military training was an integral part of the initial policy of the United States to distribute fairly the obligations of national security.

In enacting such an all-inclusive measure, the Congress had set its judgment against that of every military expert in the country—including such men as Washington, Steuben, Knox, and Hamilton.

In 1783 Washington had submitted to the Continental Congress his "Sentiments on a Peace Establishment," together with the views of many of his generals. While recommending that all members of the Militia be enrolled, he laid especial emphasis on training "only the youth and younger men." To accomplish this he recommended the formation of what he termed the "select corps" which would be chosen from the then existing regiments of Militia. In time of national emergency these would be merged to form a trained and disciplined force, ready and equipped for immediate action. The great body of the Militia, consisting of the older men, would be held in reserve, and called up as a last resort.

Both the Regular Army and the National Guard (which in 1903 supplanted the old-time Militia) normally depend upon voluntary enlistments to fill their ranks. This system, because of its prevalence in our wars before 1917, has come to be regarded erroneously as America's "traditional system" of raising her armies. It was not the system of the founding fathers, as has been shown.

It should be emphasized that the word *conscription* to describe compulsory training is both misleading and inaccurate. Conscription is forced military service. The word has never been employed in any other sense. *Military service* means active duty in the Army or Navy, subject to the orders of commanding officers to move against an enemy.

On the contrary, *military training* means that the

[★] Digest of a pamphlet prepared by Colonel Graham.

men who undergo it will be instructed as pupils, not employed as practitioners of the military art.

They will not constitute a "huge peacetime Army" or perform military service—compulsory or otherwise—nor will they be the subjects of "peacetime conscription." During the period of training they will not be servicemen at all.

When their one year's training is completed, they *will* be inactive members of a *trained* reserve and subject to a call to active duty by the Congress only in case of a national emergency.

No American military system, no matter what the plans of the War Department may be, can continue to endure or to exist against the will of the Congress which controls the necessary funds; and if the people—the men and women who constitute the voting public—desire that universal military training be discontinued at any time following its adoption, they can and will say so at the polls in no uncertain terms.

The decision now rests with the representatives of the people—the Congress of the United States.

The present age has come to be known as the "era of the common man." He has the greatest stake in his country's future, for he composes the great majority of our people. To him will always fall the duty and the burden and the honor of fulfilling the basic purposes of the Constitution, among which is the obligation to provide for the common defense.

Individual Combat Stories Wanted

Combat against the enemy is generally a team play by troops, but often it is a contest of man against man. Victorious action against the enemy does not always come from a concerted attack by a squad or larger group. Quite frequently it is made possible by the bravery and tactical ingenuity of its leader or one of its individuals. Many of our readers undoubtedly know of instances where the success of a mission was made possible because of the action of an individual or a small group. Please write it for us in 1,000 words, or more . . . the exact details of how he, or they, did it. Although such actions probably resulted because of the personal bravery of those involved, we are interested in the tactical side and the details of what made it click. Describe the moves that were made in the action . . . the distances involved . . . disposition of the enemy and that of the attacking personnel . . . weapons used . . . the difficulties and obstacles met, and how they were overcome . . . if surprise was a factor, and how it was achieved . . . any unusual behavior of the enemy, how he met the attack, how he reacted—Jap, or German. Send it, with pictures if possible, to The Cavalry Journal, 1719 K St. N.W., Washington, D. C. These stories are very important for future study, as they can be used as examples for the training of our future armies.

The National Guard Program

Officer Training Course

As a preliminary step toward the postwar National Guard, courses have been established to "orient and train selected officers for duty as instructors," it has been announced by General Jacob L. Devers, commanding general of Army Ground Forces. These courses, taking advantage of past experience, in peace and war, are designed for uniform results and to "start all National Guard instructors on a sound basis."

There will be three separate programs, one for senior state instructors, one for officer instructors other than senior state instructors, and one for sergeant instructors.

Senior state instructors, who will report to the state capital concerned approximately one month prior to the actual reorganization of the National Guard within that state, will first attend a 10-day "orientation course" in Washington, D. C. It will largely embrace study of War Department policies, National Guard history, and typical training and administrative problems. The Chief of Staff, United States Army, and the Commanding General, Army Ground Forces, are scheduled to appear before this school, together with outstanding army officers previously National Guard senior instructors and also successful in World War II combat.

The courses for officer instructors other than senior state instructors will run for 30 days at the Infantry, Field Artillery, Armored, Cavalry and Antiaircraft Artillery Service Schools. Each course will have an original capacity of 100, with a class of 50 starting every two weeks thereafter, and will offer refresher instruction on the latest tactics and technique, and general orientation on the War Department and the National Guard.

The courses for sergeant instructors, also running for 30 days at the Service Schools with 100-pupil capacities, will take up the same general orientation subjects and in addition drill on specific duties to be performed.

* * *

Tentative state allotments for the postwar National Guard have been forwarded to the governors of the states and insular possessions. The total strength of the postwar National Guard as presently contemplated by the War Department approximates 622,500 officers and enlisted men. The aggregate of National Guardsmen inducted into Federal service prior to the war was 300,034.

The planned strength calls for about 571,000 officers and men in the Ground Forces and 47,600 in the Air Forces. The prewar National Guard comprised approximately 295,000 in Ground Forces and about 5,000 in Air Forces, the latter composed of 19 Observation Squadrons (Divisional Aviation) and an additional 10 activated just before the war. In the postwar Ground Forces the principal units will be about 22 infantry divisions, **two armored divisions,** and 18 regimental combat teams. The postwar Air Forces will include about 12 wings, 27 groups, and 84 squadrons, as well as 12 control and warning groups.

In letters authorizing the allotments, the governors have been requested to undertake an immediate survey of their capabilities for recruiting and maintaining their respective allotments. In the event that changes are necessary, the National Guard Bureau indicated that the allotments may be altered.

Under War Department policy, it is normally the responsibility of the states to provide and maintain armories and storage facilities adequate for the housing of personnel and the storage of equipment. Such adequacy will be determined by Federal inspection and approval. The recruiting of personnel is also the responsibility of the states.

The state tentative allotments are:

STATE	GROUND	AIR	TOTAL
NORTHEAST AREA:			
Connecticut	10,609	789	11,398
Delaware	2,382	312	2,694
Maine	6,454	384	6,838
Massachusetts	21,056	1,505	22,561
New Hampshire	5,726	312	6,038
New Jersey	19,978	698	20,674
New York	44,112	3,665	47,777
Rhode Island	4,243	703	4,946
Vermont	3,563	312	3,875
EAST CENTRAL AREA:			
District of Columbia	2,600	789	3,389
Kentucky	7,595	384	7,979
Maryland	8,994	312	9,306
Ohio	19,982	2,551	22,533
Pennsylvania	36,632	2,948	39,580
Virginia	12,570	312	12,882
West Virginia	5,426	312	5,738
SOUTHEAST AREA:			
Alabama	10.128	1,104	11,232
Florida	7,220	312	7,532
Georgia	10,880	1,505	12.385
Mississippi	6,684	312	6,996
North Carolina	10,970	717	11,687
South Carolina	7,396	312	7,708
Tennessee	10,622	696	11,318
NORTH CENTRAL AREA:			
Colorado	5.174	1,989	7,163
Illinois	30,735	2,173	32,908
Indiana	16,237	1,087	17,324
Iowa	10,989	1,101	12,090
Kansas	7,377	312	7,689
Michigan	22,599	1,416	24,015
Minnesota	12,403	1,087	13,490
Missouri	11.576	1,522	13,098
Nebraska	5,376	312	5,688
North Dakota	3,694	312	4,006
South Dakota	4.173	312	4.485
Wisconsin	15,089	1,101	16,190
Wyoming	1,097	312	1,409
SOUTH CENTRAL AREA:			
Arkansas	7,025	312	7,337
Louisiana	10,403	703	11,106
New Mexico	3,762	312	4.074
Oklahoma	13.226	696	13,922
Texas	27,082	2,239	29,321
WESTERN AREA:			
Arizona	3.788	312	4.100
California	34,949	4,619	39.568
Idaho	5,304	312	5,616
Montana	3,788	312	4.100
Nevada	794	312	1.106
Oregon	9.009	775	9,784
Utah	4.393	312	4,705
Washington	10,712	1,526	12,238
INSULAR:			
Hawaii	8.595	312	8,907
Puerto Rico	9,693	312	10 005

The postwar National Guard contemplates the continuation of many of the units closely identified with the military history of their states of origin. Of necessity, the expansion of the National Guard Air Forces calls mainly for the activation of new units but all the former National Guard air units will be reactivated.

The principal ground and air components as proposed to the governors of the various states are as follows:

NORTH EAST AREA: *CONNECTICUT*—two regiments of the 43rd Division, one aircraft control and warning squadron, one fighter squadron; *DELAWARE*—one fighter squadron, coast and antiaircraft artillery units; *MAINE*—one regimental combat team, one fighter squadron; *MASSACHUSETTS*—the 26th Division, 51st Headquarters and Headquarters Squadron, one control and warning group headquarters, two fighter squadrons; *NEW HAMPSHIRE*—one fighter squadron, one regimental combat team; *NEW JERSEY*—the 44th Division, two fighter squadrons; *NEW YORK*—the 27th Division, one regimental combat team, 52nd Wing Headquarters and Headquarters Squadron, three control squadrons, one light bombardment group headquarters, four fighter squadrons; *RHODE ISLAND*—elements of the 43rd Division, one control squadron, one fighter squadron; *VERMONT*—one regiment of the 43rd Division, one fighter squadron.

EAST CENTRAL AREA: *DISTRICT OF COLUMBIA*—one control and warning squadron, one fighter squadron, miscellaneous antiaircraft units; *KENTUCKY*—one fighter squadron, one regimental combat team; *MARYLAND*—two regiments of the 29th Division, one fighter squadron; *OHIO*—the 37th Division, 55th Wing Headquarters and Headquarters Squadron, two control squadrons, one light bombardment squadron, three fighter squadrons; *PENNSYLVANIA*—the 28th Division, one regimental combat team, 53rd Wing Headquarters and Headquarters Squadron, two control squadrons, two light bombardment squadrons, three fighter squadrons; *VIRGINIA*—one regiment of the 29th Division, one regimental combat team, one fighter squadron; *WEST VIRGINIA*—one fighter squadron, one regimental combat team.

SOUTH EAST AREA: *ALABAMA*—two regiments of the 31st Division, one control and warning squadron, one light bombardment squadron, one fighter squadron; *FLORIDA*—one regimental combat team, one fighter squadron; *GEORGIA*—two regiments of the 48th Division, 54th Wing Headquarters and Headquarters Squadron, one control squadron, two fighter squadrons; *MISSISSIPPI*—one regiment of the 31st Division, one fighter squadron; *NORTH CAROLINA*—one regiment of the 30th Division, one control squadron, one fighter squadron; *SOUTH CAROLINA*—one regiment of the 48th Division, one fighter squadron; *TENNESSEE*—two regiments of the 30th Division, two fighter squadrons.

NORTH CENTRAL AREA: *COLORADO*—59th Wing Headquarters and Headquarters Squadron, three control squadrons, one fighter squadron, one regimental combat team; *ILLINOIS*—the 33rd Division, one regimental combat team, 56th Wing Headquarters and Headquarters Squadron, one control squadron, two light bombardment squadrons, two fighter squadrons; *INDIANA*—the 38th Division, one control squadron, two fighter squadrons; *IOWA*—two regiments of the 34th Division, one control squadron, two fighter squadrons; *KANSAS*—one regiment of the 35th Division, one fighter squadron; *MICHIGAN*—the 46th Division, one light bombardment squadron, one control squadron, two fighter squadrons; *MINNESOTA*—two regiments of the 47th Division, one control squadron, two fighter squadrons; *MISSOURI*—57th Wing Headquarters and Headquarters Squadron, one control squadron, one light bombardment squadron, one fighter squadron, two regiments of the 35th Division; *NEBRASKA*—one regiment of the 34th Division, one fighter squadron; *NORTH DAKOTA*—one regiment of the 47th Division, one fighter squadron; *SOUTH DAKOTA*—one regimental combat team, one fighter squadron; *WISCONSIN*—the 32nd Division, one control squadron, two fighter squadrons; *WYOMING*—**one mechanized cavalry reconnaissance squadron,** one fighter squadron.

SOUTH CENTRAL AREA: *ARKANSAS*—one regiment of the 39th Division, one fighter squadron; *LOUISIANA*—two regiments of the 39th Division, one control and warning squadron, one fighter squadron; *NEW MEXICO*—elements of the 49th Armored Division, one fighter squadron; *OKLAHOMA*—the 45th Division, two fighter squadrons; *TEXAS*—the 36th Division, **elements of the 49th Armored Division,** 58th Wing Headquarters and Headquarters Squadron, two control squadrons, one light bombardment squadron, two fighter squadrons.

WESTERN AREA: *ARIZONA*—one regimental combat team, one fighter squadron; *CALIFORNIA*—the 40th Division, **elements of the 50th Armored Division,** 61st and 62nd Wing Headquarters and Headquarters Squadrons, six control squadrons, one light bombardment squadron, three fighter squadrons; *IDAHO*—one regiment of the 41st Division, one fighter squadron; *MONTANA*—one regimental combat team, one fighter squadron; *NEVADA*—**one cavalry reconnaissance squadron of the 50th Armored Division,** one fighter squadron; *OREGON*—one regiment of the 41st Division, **elements of the 50th Armored Division,** one control squadron, one fighter squadron; *UTAH*—one regimental combat team, one fighter squadron; *WASHINGTON*—one regiment of the 41st Division, 60th Wing Headquarters and Headquarters Squadron, two control squadrons, one fighter squadron.

INSULAR POSSESSIONS: *HAWAII*—two regimental combat teams, one fighter squadron; *PUERTO RICO*—two regimental combat teams, one fighter squadron.

The Organized Reserve Corps

OFFICERS of the Organized Reserve Corps today are giving serious thought to future policies and plans for the training and employment of this vital force in our National Security System. This is shown by the marked increase of memberships in the Reserve Officers' Association, and the Organized Reserve Corps.

The plan drafted for the United States Military establishment calls for a three component set-up: the Regular Army, the National Guard and the Organized Reserve Corps.

The Organized Reserve Corps will be composed of the Active Reserve, and an Inactive Reserve. The Active Reserve will consist of those individuals and units sufficient in numbers and types which will, together with other components, constitute an over-all balanced force in the Army of the United States. The number and types of units to be activated will be dependent on the approved War Department Troop Basis for the Organized Reserve.

The plan calls for the organization of the Reserve component into three classes. Class A will include fully organized units, complete with full T/O complement of officers and enlisted men with all organizational equipment. Class B units will be provided with a full complement of officer personnel and enlisted cadre plus a portion of unit equipment. Class C units will be those provided only with a full complement of officer personnel.

Allocation of these units will be based on: the density of male population of military age within certain sections of the country, in order to provide proper distribution of the units within military areas; the availability of personnel for the units requiring technically trained personnel; and the availability of regular army and National Guard units to facilitate training.

Reserve Units will be organized initially as Class C units and will progress through a prescribed training and organizational cycle until they have reached Class A.

Officers who receive assignments in one of these units will be assigned in the grade held in the ORC; however, officers with wartime experience, who have satisfactorily performed duties of a higher grade, may be promoted to fill T/O vacancies in such units. Graduates of ROTC and Officers' Candidate School will form a source of subsequent procurement as well as officers who served honorably in the armed services.

Initial assignments of enlisted men will be made from volunteers who are veterans and have served honorably in the armed services in the present war. Other sources of enlistment will be the men being discharged from the armed services, and from the voluntary enlistments in the ORC.

Officers and enlisted men who are not assigned to ORC units will constitute a reservoir of strength needed for the expansion of the Army of the United States, and as replacements for all components. All enlisted men will be considered in the Active Reserve, and Officers who meet the standard prescribed by the War Department will be classed as Active Reserve. Officers who fail to meet these standards will be placed on Inactive Reserve.

Training objectives will be accomplished through: (1) Active Duty. (2) Attendance at Service Schools. (3) Inactive duty training. (4) Army Extension Courses.

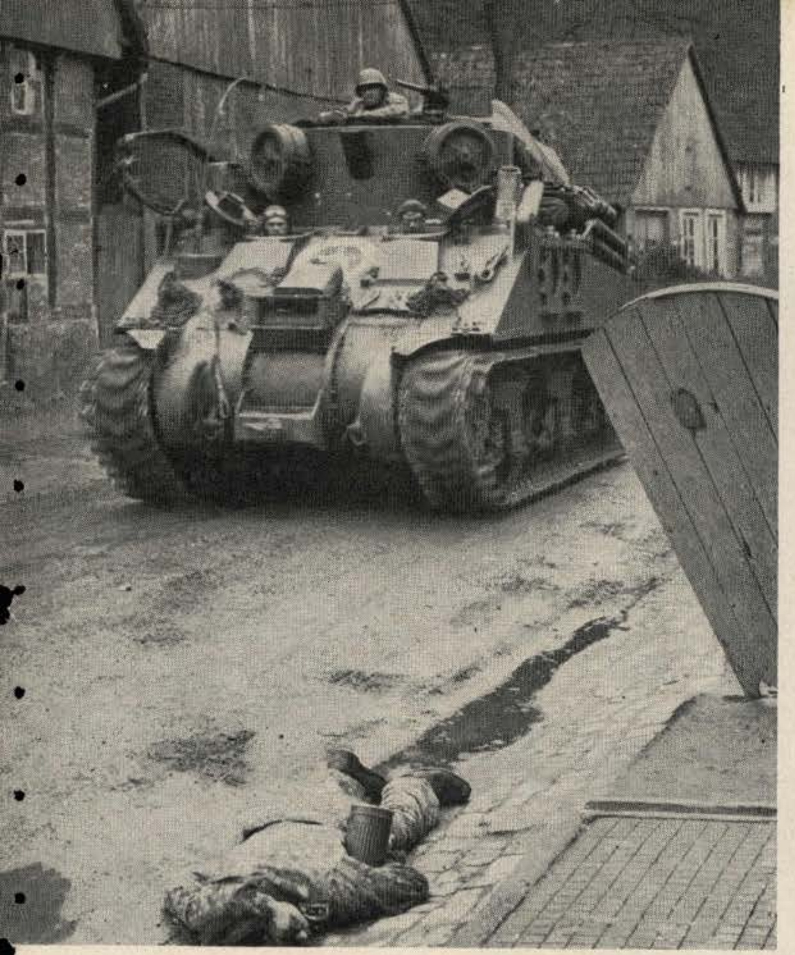
Every opportunity will be provided for enlisted men and officers to advance and earn promotion. An opportunity will be provided for both enlisted men and officers to progress through the entire system of military schooling. Reserve Officers will be offered the opportunity to attend the same courses as officers of the Regular Army. Selected enlisted men will be detailed to officers' candidate schools and become eligible for appointment as second lieutenants. The grades and ratings for enlisted men assigned to units will be the same as those prescribed for Regular Army.

Instructors will be assigned to the Organized Reserve Corps in a sufficient number to efficiently supervise the instruction and administration of all units. Warrant Officers or enlisted instructors will be assigned to assist commissioned instructors on the basis of one or more for each commissioned instructor.

The provision for fully manned and equipped Reserve Units probably is the most progressive step yet taken for training members of the Reserve Component. In addition to the training value of uninterrupted contact between enlisted men and officers in perfecting themselves and their unit for emergency service, the *esprit de corps* developed by membership in a flesh and blood unit rather than one which exists only on paper is inestimable.

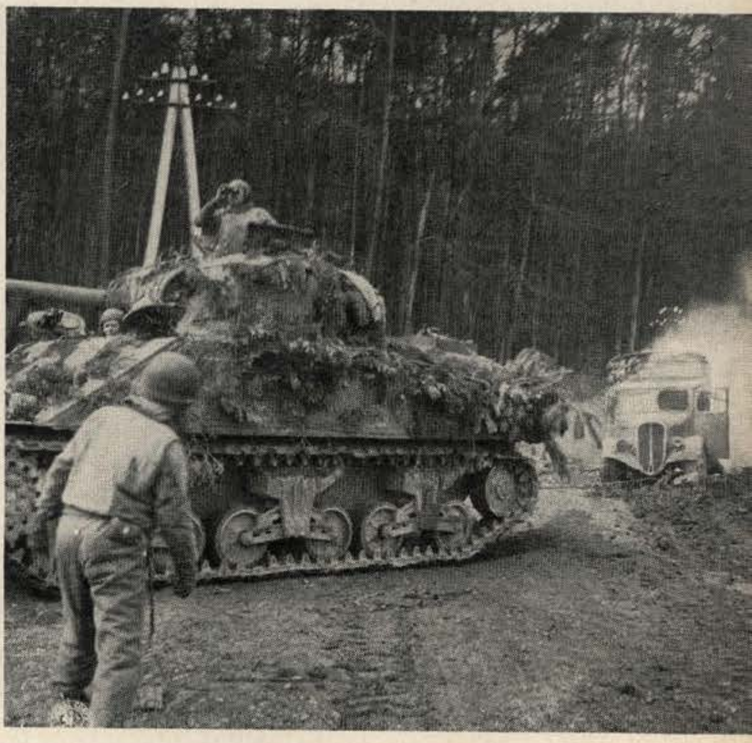
Although it is realized that the information presented here is scant, it is all that is available at the present time.

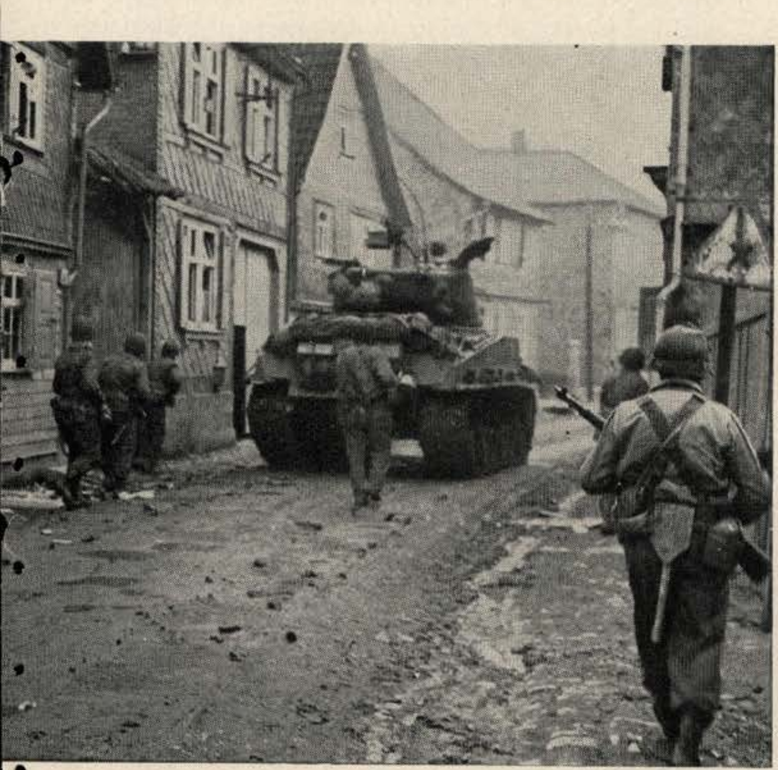
As plans progress and new information becomes available it will be disseminated to the field.



A 5th Armored Division tank, U. S. Ninth Army, passes a dead Nazi as it drives through Germany on April 2, 1945.

A burning German vehicle, knocked out by the Ninth Army, and which was obstructing the highway, is towed clear by a 7th Armored Division tank of the 31st Tank Bn.





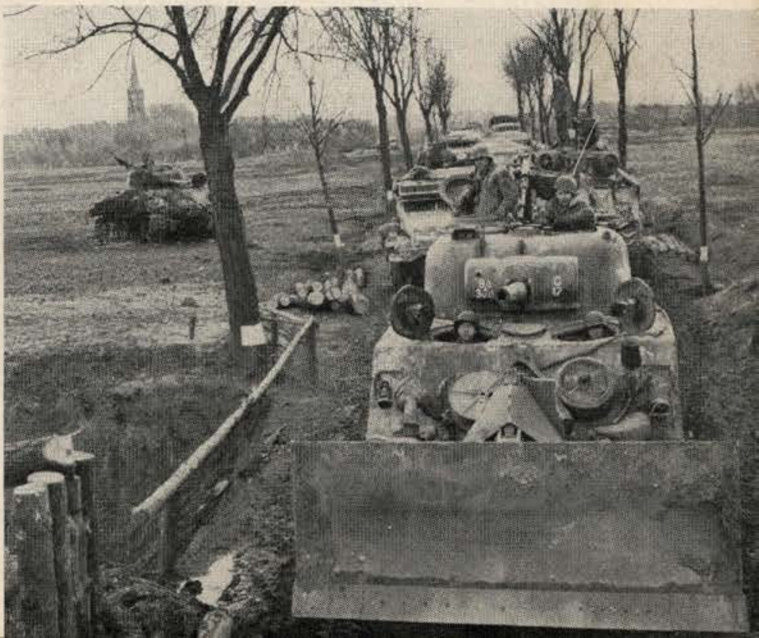
A tank of the 6th Armored Division, U. S. Third Army, followed by infantrymen, advances through the town of Oberdorls, Germany, which this division captured.

U. S. ARMORED DIVISIONS IN WORLD WAR II

(To be continued)

Signal Corps Photos

Tankdozers of the 8th Armored Division, U. S. Ninth Army, are shown being driven over tank traps in Germany.



Book Reviews

THE NRA BOOK OF SMALL ARMS. Vol. I, Pistols and Revolvers. By W. H. B. Smith. Military Service. $10.00.

There has long been a vital need felt for a comprehensive book on small arms which gave more than a meager coverage of technical data. Under the auspices of the National Rifle Association and the Military Service Publishing Company, the author of *Basic Manual of Military Small Arms,* has met this need with regard to pistols and revolvers in the first volume of *NRA Book of Small Arms.* Subsequent volumes to be published about a year apart, will cover Rifles and Shotguns, Submachine Guns and Machine Guns, and Ballistics.

The first section of Volume I gives an analysis of the functional development of hand weapons. The second and largest section, handled by calibers and arranged alphabetically by manufacturers names, includes exhaustive technical and ballistic data as well as complete operational details of important major weapons. The third section is given over to excellent illustrations and minute details of each minor weapon. A complete glossary gives full and comprehensive explanations of all technical terms used.

No book of this type would be complete without a thorough coverage of ballistic data. Entirely new information on United States revolver and pistol cartridges was compiled by the Western Cartridge Company. The H. P. White Company prepared the material on foreign and obsolescent cartridges.

This is without any question the most exhaustive book in publication on the subject of small arms. Its value to military and sports men cannot be estimated. Undoubtedly it will be a must for any complete library, personal or public.

* * *

CLOAK AND DAGGER. By Corey Ford and Alastair MacBain. Random House. $2.50.

SUB ROSA. By Stewart Alsop and Thomas Braden. Reynal & Hitchcock. $2.50.

The lurid and fascinating tale of the work of the Office of Strategic Services will probably never be told in its entirety—certainly not for many years. *Cloak and Dagger,* whose authors were connected with OSS, gives a few scattered and exciting stories of the men who went into the far corners of the world bent on propaganda, sabotage, intelligence work, and the organization of underground warfare. Brief and sketchy as these stories are, they rival any mystery or spy story for reader-interest, and at least give an inkling of the kind of a job undertaken by these anonymous men. The complexities of modern warfare are once again emphasized, as well as the versatility demanded of any army if it is to compete successfully with unscrupulous nations.

Unfortunately several incidents, such as the negotiations with General Wolff, are not adapted to summarization and the reader is left somewhat confused by the whole episode. Most of the cases, however, are excitingly handled and suffer only from a want of finer writing, a not too important requisite for this type of factual thriller.

Sub Rosa covers much the same material, and many of the same incidents, contained in *Cloak and Dagger.* Its authors were actually engaged in active "behind the lines" activities, both were with a "Jedburgh" mission, and their accounts are well written and have a most authentic note.

In *Sub Rosa* the authors do not hesitate to acknowledge many obvious weaknesses, and to point out specific faults which undoubtedly could have been corrected to advantage. Both of the books on OSS are interesting reading, but the last named is a superior piece of workmanship and a more constructive analysis.

* * *

PATTON: THE FIGHTING MAN. By William Bancroft Mellor. Putnam. $3.00.

It is perhaps unfortunate that the author has chosen to call this book *Patton: The Fighting Man* because as a study of this great general's tactics and campaigns it is far from an adequate contribution to our knowledge. However, it is an excellent biography of his earlier years, and the material generously contributed by his immediate family has enabled Mr. Mellor to give an accurate and extremely interesting picture of the youth and young manhood during which a great cavalryman grew into a magnificent general.

That portion of the book dedicated to this war is hurried and unsatisfactory. Someday a great story will be written about North Africa, Sicily and the Battle of the Bulge—but time must amalgamate the factors and the author will have to be a former staff officer, or a very serious student of military affairs.

Mr. Mellor's biography, hurried though it is, is better than might have been expected, and will certainly be of considerable interest to those who are not familiar with the early training and military experiences of George S. Patton, Jr.

* * *

GENERAL GEORGE CROOK: HIS AUTOBIOGRAPHY. Edited and annotated by Martin F. Schmitt. University of Oklahoma Press. $3.00.

His autobiography covers General Crook's life from his graduation from West Point in 1852 to June 18, 1876. His entire military career with the exception of the four Civil War years, was on the frontier.

While there is little new information added to our knowledge of the Civil War period or the west of the 19th Century, the frank analysis of situations and blunt, occasionally caustic, judgements of men and situations makes interesting reading. Students of this period will find much material in this objective and lively book.

THE STORY OF THE STARS AND STRIPES. By Bud Hutton and Andy Rooney. Farrar & Rinehart. $3.00.

Unique alike in the army and the newspaper profession, *Stars and Stripes* filled one of the most important needs of the soldier in the field—an outlet of self-expression wherein a man saw his gripes, his problems, his fears and sometimes his triumphs expressed as he could not express them himself. Somehow it made him feel better.

The Stars and Stripes of this war varied greatly from its predecessor of World War I although from all evidence it will father as many nationally known newspapermen of a high caliber as did the earlier paper. With a fine balance of humor and acumen, Bud Hutton and Andy Rooney have told the inside story of the eccentric and unmilitary staff and its efforts to honestly report the war.

Racy anecdotes of the staff, whether in their offices in the building of the staid and conservative *London Times*, drinking in the near-by pub, setting up shop in battered buildings on the continent or seeking news in combat, make fascinating reading. Underlying these lively accounts there is a more serious vein concerned with the many problems that faced these incorrigible newspapermen.

The book is extremely entertaining, and its reception by reviewers of such papers as the *New York Times* and the *New York Herald Tribune* is both interesting and significant.

* * *

FROM OMAHA TO OKINAWA. By William Bradford Huie. E. P. Dutton Co. $2.75.

Mr. Huie has already written *Can Do!*, and *Seabee Roads to Victory* to give the public an idea of what this amazing branch of the service contributes to total war. In this latest book he describes the work of the Seabees in the landings on the Normandy coast, Iwo Jima, Tinian, Saipan, Guam, the Philippines and Okinawa. Excellent photographs show the Seabees at work.

The tremendous job of building airfields, roads and other engineering projects was magnificently performed by these technical men, frequently too old for the regular army and navy. Unfortunately, too much space is given to names and individual addresses, robbing the book of much of the power it might have attained at the hands of a more objective writer.

* * *

HOW TO BE A CIVILIAN. By Morton Thompson. Doubleday, Doran. $2.00.

The author of the zany *Joe the Wounded Tennis Player* has written an amusing handbook illustrated by Charles Pearson of *Yank* for the returning veteran. Much sound advice is interspersed with humorous instructions and comments. How to Buy Civilian Clothes, The Job Deal, Organizations, TS and Hitting the Book are some of the chapter headings and much worthwhile advice will be found under them.

The language is that of the veteran, and may confuse the layman, but *How To Be A Civilian* will prove amusing to all readers.

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WHILE YOU WERE GONE. Edited by Jack Goodman. Simon and Schuster. $3.50.

Originally planned primarily for the information of the veteran, this brilliant symposium has been developed into a popular history which will interest the intelligent civilian as well as the men who have been out of touch with happenings in the nation.

Twenty-four phases of the American home front at war are portrayed through the eyes of twenty-six authors (two of the chapters are collaborative). Each contributor is an authority on the subject discussed and the editor has endeavored to maintain a middle of the course balance in his selection of authors. While this policy has not resulted in an impartial study, it has produced a variety of weighed opinions, sometimes at variance and occasionally controversial. Any reader will inevitably take issue with some viewpoints and agree with others; but everyone will find interest and amusement in the quizzical and clever descriptions of the civilian front, and much valuable information in the serious analyses of important occurrences.

* * *

MOM, I'M HOME! By Hoff. Doubleday, Doran. $2.00.

THE WOLF. By Leonard Sansone. Crown. $1.00.

The author of *Mom, I'm Home!* says, "The author is bitterly ungrateful to World War II for the ideas in this book." This lack of gratitude will be understood but not concurred in by the reader of Syd Hoff's sensitively humorous depiction of the confusing incidents of a returning soldier.

The Wolf needs no introduction. His career is continuing with its usual success.

* * *

REVEILLE FOR RADICALS. By Saul D. Alinsky. Chicago University Press. $2.50.

The title of this book is both daring and unfortunate. It may repel many readers and that would be a most unfortunate circumstance. Mr. Alinsky describes a "liberal" as one who dreams dreams, a "radical" as one who builds the world of men's dreams. He brings out the indisputable historical fact that the men we most revere in this country were radicals, Thomas Jefferson, Thomas Paine, Benjamin Franklin, Patrick Henry, and a score of others.

A particularly significant chapter for present-day readers points out the similarity between big business and labor organizations. The attitude is clear visioned, and the phraseology unequivocal.

The building of People's Organizations in various communities with an aim to accomplish collectively what cannot be done singly is interesting and encouraging. The methods of organization are described and the plan of activity outlined.

Any reader interested in national affairs will find much instructive material in these pages and the "radical" concerned with a desire to do something more than commiserate with the poor, the uneducated, and the otherwise handicapped, will find a definite stimulus and direction.

THE BALANCE OF TOMORROW. By Robert Strausz-Hupé. Putnam. $3.50.

The author of *Geopolitics* has turned his attention to the bases from which world power is derived, with particular attention to the potential assets of the United States. He takes into consideration the problems of population, agricultural resources, industrial possibilities and natural resources. He measures our assets and analyzes our trends, not overlooking the importance of the less tangible, but equally important, spiritual forces, and their influence on our foreign policy.

One passage of particular significance at this time bears quoting here:

"American power will be dependent upon the military force available at any given moment. The dangers of the future can no longer be met by the improvisation of a large fighting establishment. A minimum of strength will have to be available at any time, not only on paper, but so equipped that it can intervene on distant battlefields at short notice. Never again will the United States have three or four years to arm in wartime while the enemy is being kept at a safe distance from the centers of America's power."

* * *

TROUBLE ZONE. By Leon Dennen. Ziff-Davis. $1.50.

In 1944 the author of this little book left New York for Istanbul, Turkey, on a rescue mission for an unnamed American relief agency. After nine months in the Balkans and the Middle East he saw the spiritual and political situation in that area as a vast conflict between England and Russia.

The political situations in this particular portion of Europe have always been confusing and frequently fraught with dynamite. Any country involved in its many-faceted problems will inevitably be criticized by observers, particularly Americans who are not as a rule too well versed in middle European political and social aspects. Whether or not Mr. Dennen's condemnations and appraisals of British and Russian actions are correct is a matter of conjecture. Much information that he gives is of considerable interest and his conclusions that only a democratic federation based on cooperation will bring peace to these small countries are in line with most constructive thinkers.

* * *

WAR YEARS WITH JEB STUART. By Lt. Colonel W. W. Blackford, C.S.A. Scribners. $3.00.

It is not known just when Colonel Blackford wrote down his recollections of his associations with General Stuart, but it is clear that time enough had elapsed for the war years to have become glamorized and for memory and subsequent information to have become somewhat mixed. The author is not objective, and it would be an anachronism if he were. He has recounted his experiences under the most glamorous general of the Civil War; military engagements are described but people, personalities, and entertainments are not forgotten. The charm of this interesting and nostalgic record is that of Thomas Nelson Page and is better read as a delightful, if somewhat fanciful, picture of an era rather than as a military history.

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SOLDIERS OF GOD. By Christopher Cross in collaboration with Major General W. R. Arnold. Dutton. $2.75.

The Chaplain Corps has always performed outstanding service in wartime. The story of their work and specific incidents of loyalty, service and bravery, beyond the bounds of sectarianism in a world made one by war give a lesson in unity and tolerance that is needed even more in peace.

* * *

DUTY TO LIVE. By Emmett Dedmon. Houghton-Mifflin Co. $2.50.

The author of *Duty to Live* flew combat missions against France, participated in the North African invasion, and returned to fly missions against targets in Norway and Germany. For six months he served as navigation staff officer at Eighth Bomber Command. His plane was set afire over Hanover, Germany on July 26, 1943 and while he parachuted to safety it was behind the German lines and he was held as a prisoner for almost two years. During this period he wrote and rewrote the story of a bomber crew.

The characters in this novel were stationed in England, and represent a variety of American backgrounds and education. Flash-backs tell the story of each of the men, one, the son of a famous surgeon; an Italian-American who joined up because his brother was killed in a Jap prison camp; a soldier who was seeking to shed responsibility and secure enough money to pay for his cheap pleasures; a Mexican caddy who sought the realization of a democracy which had never existed in the town of his birth; there is the bombardier who was still hoping to be a pilot; another to whom the war came as a disruption of a well ordered life; and the navigator, who saw something to paint in every scene.

Unfortunately Mr. Dedmon puts almost too much technical detail into his otherwise penetrative novel. This tendency, the result of a thorough knowledge of his subject, makes the early part of the book a little dry but after the first few chapters he moves into a smooth and interesting story of the welding of a heterogeneus group into an integral whole.

* * *

LIGHT HORSES. By Cecil F. Rooks. Ziff-Davis Co. $2.00.

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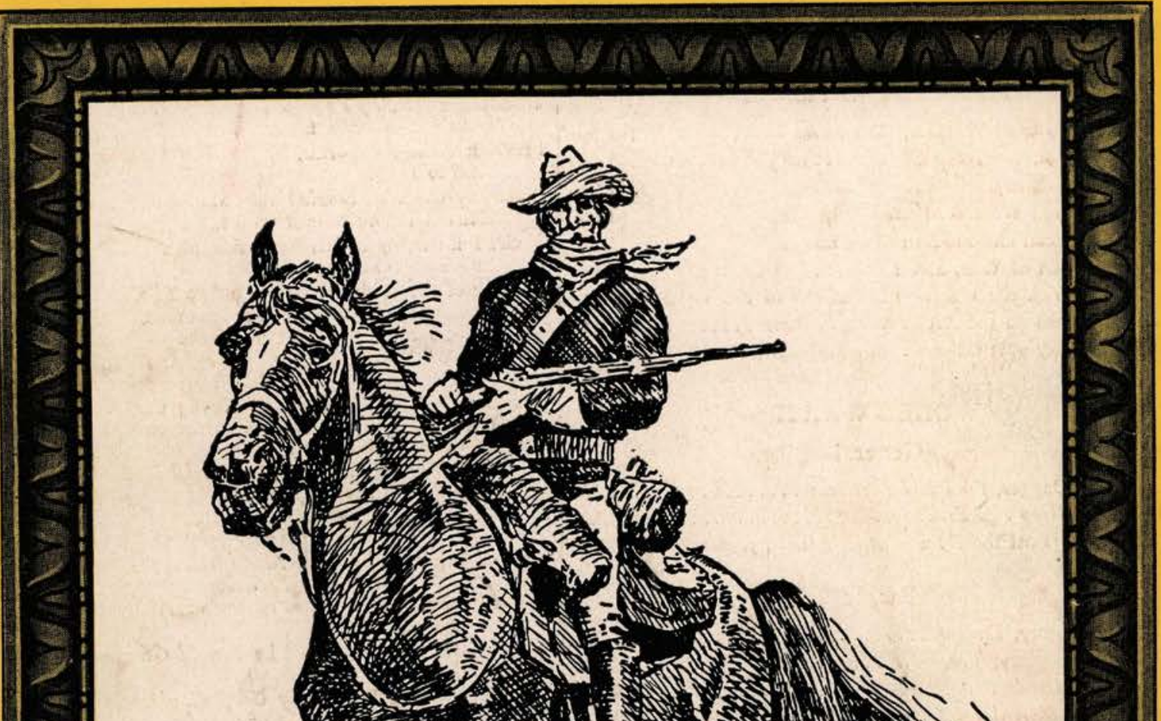
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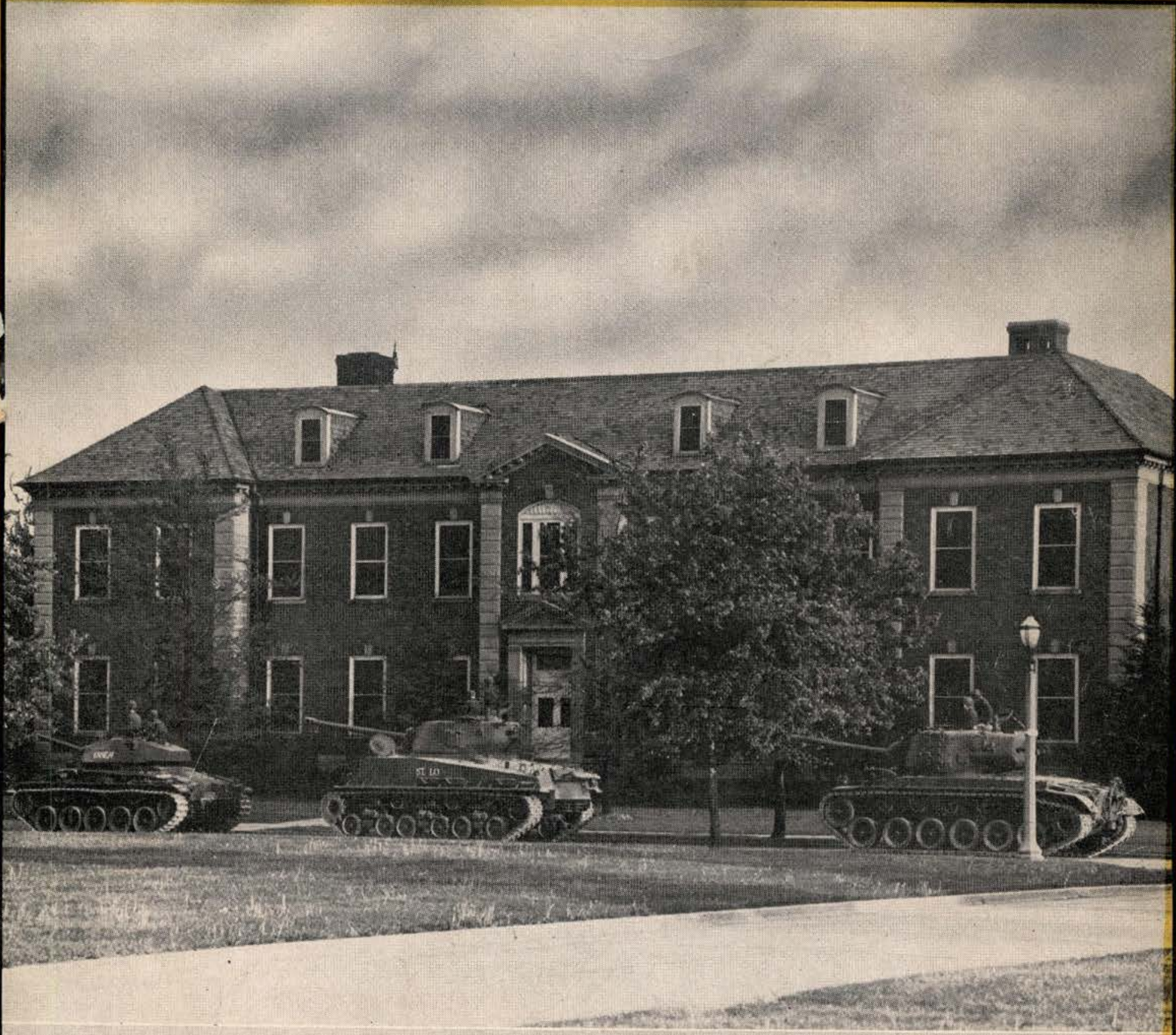

U. S. Signal Corps Photo

HEADQUARTERS, THE ARMORED SCHOOL, FORT KNOX, KENTUCKY
Tanks pictured are, left to right, M24 light, M4 A3 E8 medium, and M26 heavy

MAY-JUNE, 1946

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The aim and purpose of the Association shall be to disseminate knowledge of the military art and science, to promote the professional improvement of its members, and to preserve and foster the spirit, the traditions, and solidarity of the Cavalry of the Army of the United States.—Article III, Constitution.

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A CAVALRY GROUP WITH AN ARMORED DIVISION

by Captain Alan R. Probst

Abridged from the official, after-action reports of the 101st Cavalry Group (Mecz).

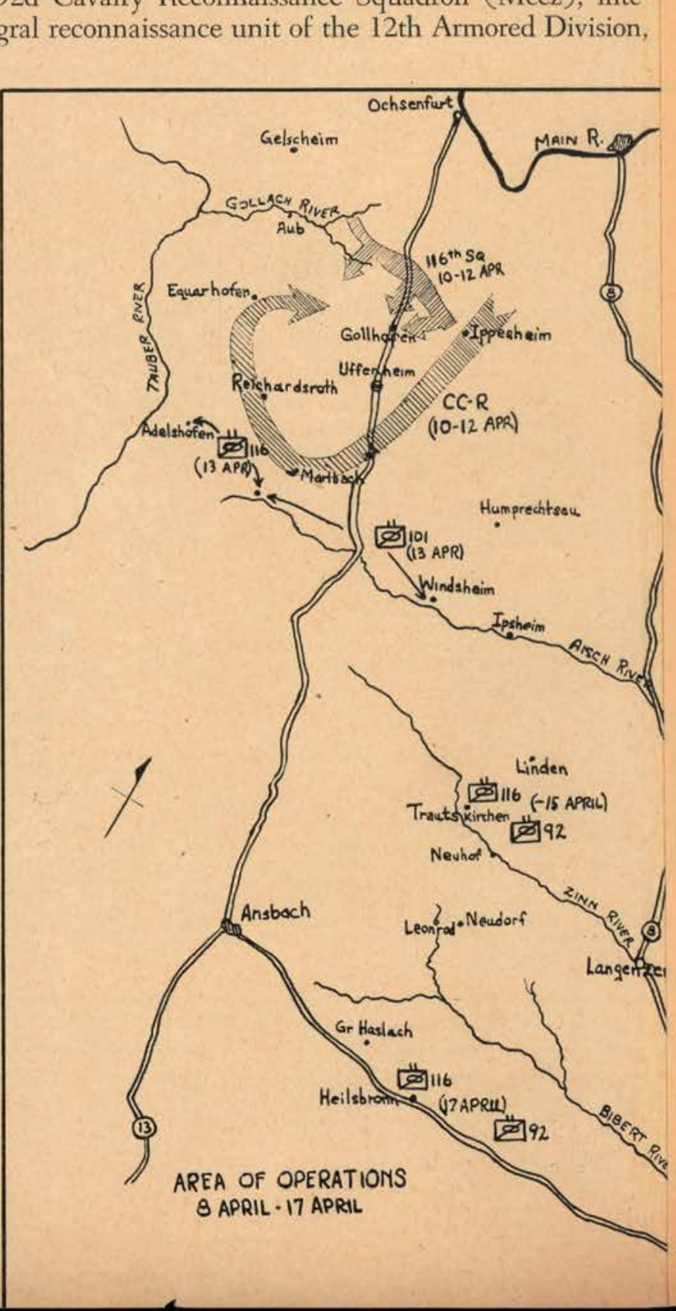
IN an area offering adequate road nets, a cavalry group and an armored division can operate together over a relatively wide front to mutual advantage. So long as sufficient road space is available, the group can operate along the flanks and to the front of the division, developing the contour of enemy centers of resistance, providing security, mopping up between the prongs of the combat commands. In such a situation, the group is given the opportunity to utilize to the utmost its characteristic mobility. Provided with a suitable attachment of other arms it becomes an additional task force, extending the area of operations of the division.

This article describes the operations of the 101st Cavalry Group (Mecz), Colonel Charles B. McClelland commanding, while attached to the 12th Armored Division, commanded by Major General Roderick R. Allen. In abridging the official report, three typical periods of operation have been covered in some detail. Locations of command posts have been deleted, and certain other data necessary to official reports, such as numbers, dates, and times of Operation Instructions have been eliminated in order to permit concentration on the manner in which operations developed. Because this is an account of Group action, the operations of major subordinate units are described, and little detailed account is given of the exploits of individual units.

Just prior to attachment of the Group to the 12th Armored Division, both units had been operating on the right flank of the XXI Corps, which was driving across Germany east of the Rhine to seize Wurzburg and the crossings over the Main River to the south of the city. Both units were located south of the southernmost loop of the Main in the open, rolling terrain below Wurzburg. At the time the attachment was made on April 8, the Group was composed of Group Headquarters, the 101st Squadron, with Lieutenant Colonel Milton Kendall, commanding, and the 116th Squadron, with Lieutenant Colonel Hubert C. Leonard commanding. The offensive operations which followed developed into a pursuit of the rapidly crumbling enemy forces which led rapidly south to the passes into the much-touted "National Redoubt" in the Alps.

INITIAL MISSION

The initial mission of the Group was to conduct a reconnaissance in force to the northeast in a zone approximately 30 kilometers in width, to a limiting line on the high ground southeast of the Aisch River. The 92d Cavalry Reconnaissance Squadron (Mecz), integral reconnaissance unit of the 12th Armored Division,


Ochsenfurt
Gelscheim
MAIN R.
GOLLACH RIVER
Aub
116th Sq
10-12 APR
Equarhofen
TAUBER RIVER
8
Gollhofen
Ippesheim
Uffenheim
Reichardsroth
CC-R
(10-12 APR)
Adelshofen
116
(13 APR)
Martbach
Humprechtsau
101
(13 APR)
Windsheim
Ipsheim
AISCH RIVER
Linden
116 (-15 APRIL)
Trautskirchen
92
Neuhof
ZINN RIVER
Ansbach
Leonrod
Neudorf
8
Langenzen
Gr Haslach
116
Heilsbronn
(17 APRIL)
92
BIBERT RIVER
13
AREA OF OPERATIONS
8 APRIL - 17 APRIL

was given a contiguous zone to the left of the Group. The Group was reinforced by the attachment of one company of medium tanks, and the 495th AFA Bn was placed in direct support. The medium tanks were further attached to the squadrons and the Group moved forward, squadrons abreast, with the 101st Squadron on the right. Resistance was very determined. By nightfall the 101st Squadron had reached the Tauber and Gollach rivers in its zone. The 116th Squadron was approximately three kilometers short of the Gollach in its zone.

Both squadrons continued pressure during April 9. Enemy resistance was well defined along the Gollach River. As a result of the information gained, the Division launched two combat commands in simultaneous encircling movements, CC-R attacking south and southwest in the Group zone, and CC-B in a similar maneuver in the zone of the 92d Squadron. The 101st Squadron was assembled prepared to follow CC-R through the gap created and continue the reconnaissance mission to the limiting line as the Combat Command turned west and northwest in its encircling move.

Counterattacks at two points in the 116th Squadron zone were beaten off during the night of April 9-10. The CCs jumped off in the morning, and CC-R advanced approximately three kilometers in heavy fighting during the day. The attack was renewed the next morning, the Combat Command still moving forward slowly as the enemy defended stubbornly from every vantage point. The 116th Squadron maintained pressure against the enemy confronting it but made no appreciable gains. In the afternoon a task force of Troop C, 116th Squadron, one platoon of medium tanks, one platoon each of light tanks and assault guns, attacked from the northwest to clear Gollhofen, a strongly held town which was blocking the principal north-south road through the Group zone. Another task force—composed of Company F, 101st Squadron, one platoon of Troop B, one platoon of medium tanks, and two platoons of Troop E, 101st Squadron—attacked from the northeast. The forces succeeded in fighting their way into the town in the late afternoon, but were unable to hold their positions and pulled back before dark.

During the night the enemy made a tank attack against the Command Post of the 101st Squadron. It was beaten off without serious losses. At dawn the CP area was strafed and bombed by enemy jet-propelled planes. CC-R continued its attack and broke the core of enemy resistance confronting it. The Combat Command moved rapidly south, with the 101st Squadron covering its left flank until it turned west and northwest in the encircling move. The Squadron continued east on the reconnaissance mission against continued resistance. By nightfall the Squadron had reached a line roughly three kilometers from the west banks of the Aisch River.

In continued pressure throughout the day, the 116th Squadron reached the Gollach River line in its zone. At 1530 liaison was effected with elements of CC-R, and the two units continued pressure on the forces pocketed. The eastern end of the pocket could not be closed, however, and OPs reported considerable movement of enemy vehicles in that direction. During the night, artillery fire was laid down with good effect.

Early April 13 both squadrons again moved forward, the 116th Squadron moving rapidly south and east until strong opposition developed along the Aisch River and progress was halted. The 101st Squadron continued in its zone against heavy resistance. The Squadron command element and reserve were attacked in force about midday by infantry, self-propelled guns, and tanks. The attack was beaten off and heavy casualties were suffered by the enemy infantry. One Mark IV tank and four self-propelled guns were destroyed. By nightfall the Squadron had reached the Aisch River in its zone.

In the course of this operation, the Group reconnoitered a zone approximately 30 kilometers in width to a depth of 25 kilometers in the face of determined enemy resistance, outlined the enemy's MLR along the Aisch River, inflicted heavy casualties in both men and matériel and captured 384 prisoners. Late April 13 the 101st Squadron was attached to the 4th Infantry Division, effective April 14, and remained with that unit until April 19.

The Turn to the South

In the next series of operations, the direction of effort swung more to the south, as corps and army boundaries were affected by the operations of other units coming down from the north. On April 14 all Division units were alerted to exploit on three hours notice in a zone roughly 30 kilometers in width. Bounded on the northeast and southwest by Highways 8 and 13 respectively, the zone by-passed Nurnberg to the southwest to an objective line roughly 30 kilometers south and southwest of that city. The Division was to move in two columns with axes along the highways at the flanks of the zone. The Group was reinforced by attachment of the 92d Squadron (less two troops), the 342d AFA Battalion, and two platoons of medium tanks, and was directed to move in the zone between the axes of the combat commands to the objective line. Upon reaching the line, the Group was to be prepared to continue the attack to the southeast, or to attack to the north or south on Division order. All elements were directed to report their arrival on Division Phase Line No. 1, the Ansbach-Nurnberg road.

Again the Group disposition was squadrons abreast, with the 116th on the right and the 92d Squadron on the left. The main effort of both Squadrons was directed toward the center of the Group zone. The 116th Squadron displaced east to reach its new zone. The Aisch River was reached without incident. All bridges having been destroyed, the Squadron located a ford and expedited repair of a bridge. Once across the river, reconnaissance was pushed forward to the high wooded ground southeast of the river, where determined resistance was met. As there was no suitable crossing in the zone of the 92d Squadron, Troops A and D crossed in the zone of the 116th Squadron, and also advanced to the high ground. The enemy counterattacked during the crossing. One of his tanks was destroyed and two damaged, and the attack was repelled.

Early April 15 both Squadrons resumed the attack. At about 1300 the 92d Squadron pushed through in its zone and by nightfall had advanced to the Zinn River. The 116th Squadron was unable to overcome the enemy in its zone, and at 1700 disengaged and passed through the gap opened by the 92d Squadron. The 116th Squadron then moved southeast against light resistance, and by nightfall had reached the Zinn River in zone.

On April 16 the 116th Squadron, unable to find a crossing in its zone, cleared a bridgehead and covered the construction of a treadway bridge at Trautskirchen. The Squadron crossed in the afternoon, seized two towns south of the river, and knocked out several defended roadblocks. At dusk an enemy column marching toward Neudorf, the last town taken, was surprised and dispersed with heavy casualties by artillery and small-arms fire.

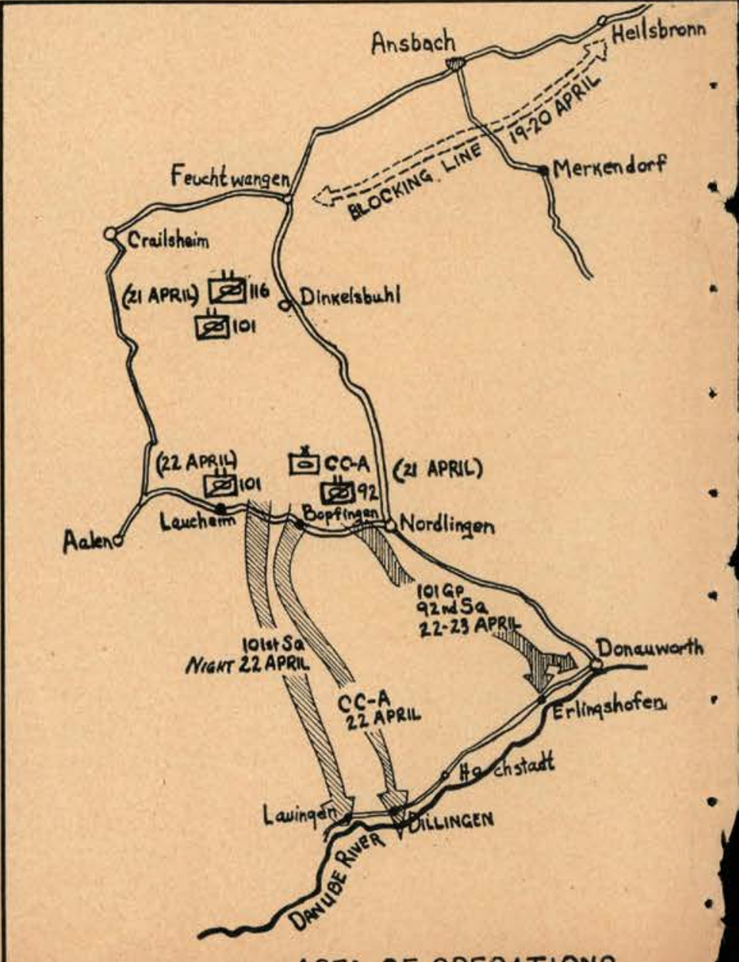
The 92d Squadron in its area at Neuhof found a bridge which had been prepared for demolition, and was blocked by fallen trees and strongly defended, but was still intact. After an all-day battle, the bridge was seized and the demolitions and trees were cleared. The Squadron crossed in force at 1800, seized and cleared the town, and outposted it for the night.

During April 17 both Squadrons advanced against disintegrating resistance. Over the Bibert River, undefended crossings were found that were close to crossings that were hotly defended. By nightfall both squadrons had reached and outposted the Ansbach-Nurnberg highway in zone. During the four days' operations, the Group had advanced 43 kilometers in covering the zone between the two columns of the Division. In addition to casualties inflicted on the enemy, 332 prisoners were captured.

On April 18 the direction of the Division attack was turned southwest along the axis Ansbach-Feuchtwangen-Crailsheim. CC-B was directed to seize Feuchtwangen, CC-A to follow and secure Ansbach. The Group was directed to move south and west by all available routes, and to protect the left flank of CC-B, and assist in the attack on Feuchtwangen. Squadron axes were prescribed so that the Group would be brought southwest to an objective line extending south four to eight kilometers from Feuchtwangen. The Group met resistance almost immediately upon moving out. Both Squadrons pushed south and west against a series of delaying actions. At 2000, Troop C, 92d Squadron, reached the main north-south highway south of Ansbach and surprised an enemy column en route toward Ansbach. Artillery and assault gun fire were placed immediately and with good effect, and the troop consolidated its position along the highway.

Troop C, 116th Squadron, one platoon each of Company F and Troop E attached reached Merkendorf, farther south along the same highway, and fought its way into the town. Elements of both 17th SS Panzer Grenadier Division and the SS Totenkopf Division were driven from the town, and they assumed new defensive positions approximately one kilometer east and southeast of the town. At about 0430, April 19, the SS troops counterattacked, striking simultaneously from the east, south, and northeast. After a two-hour series of hand-to-hand engagements, the fanatic assaults of the attackers were repulsed. The troop reorganized at daylight in time to break up an attempt to reinforce the enemy still in the town. Eighty of the SS troopers who participated in the initial attack were killed, 16 captured, and an undetermined number wounded. The troop and attached units suffered casualties of two killed, 10 wounded, and seven missing, and several vehicles destroyed. Of the seven missing, two later escaped their captors and returned to their unit.

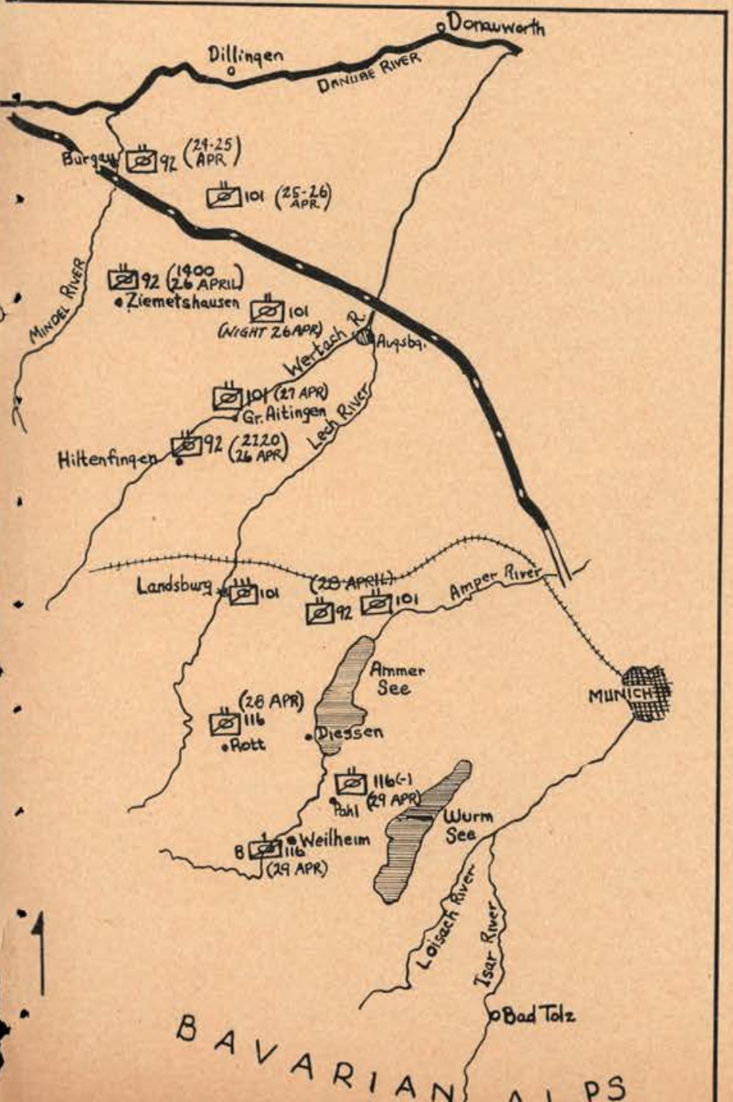
During the night of April 18-19, instructions were received that XV Corps had been given responsibility for Nurnberg. The direction of the Division attack was turned south at Feuchtwangen and the new Division axis was to pass through Lauchheim on the Aalen-Nordlingen highway. The Group was directed to block along a 50-kilometer line extending from near Feuchtwangen east and north to Heilsbronn on the Ansbach-Nurnberg highway, and to maintain contact between the 12th Armored Division and the 42d Infantry Division, of the XV Corps.



AREA OF OPERATIONS
18 APRIL-23 APRIL

The 101st Squadron was relieved from attachment to the 4th Infantry Division and returned to the Group at 1400, April 19. During April 19 the three squadrons moved into assigned positions in the protective screen, while the Division turned in its new direction. On April 20, the Group was relieved of its blocking mission, and directed to reconnoiter to the south in the Division zone. Initially, the 101st Squadron covered the entire zone until the 92d Squadron could move south and west from its blocking positions. The 116th Squadron was held in Group reserve. A further modification of Division plans on April 20 sent CC-A to the south in two columns. The 92d Squadron was directed to operate in the area between the columns. Progress was fairly rapid during the day, but slowed in the afternoon as resistance became more determined. By nightfall CC-A and the 92d Squadron were approximately three kilometers short of the objective line along the Aalen-Nordlingen highway.

The 101st Squadron, operating in the area between the westernmost column of CC-A and the Division's west boundary, found progress more difficult. At nightfall it was in position west of Dinkelsbuhl and was maintaining contact with enemy forces in the wooded areas to the south. The 116th Squadron was assembled in the 101st Squadron area.



AREA OF OPERATIONS

Late April 23, orders were issued for the seizure of crossings over the Danube River between Donauworth and Gundelfingen. CC-A was to continue to the south and seize crossings in the Dillingen area. CC-B, after assisting the 92d Squadron to clear the enemy confronting it, was to seize crossings in the Hockstadt area. CC-R was given the mission of blocking to the east on the Aalen-Nordlingen highway. The Group was directed to send one squadron south along the Division left flank and to seize crossings in the Tapfheim-Erlingshofen area. The other squadrons were to mop up resistance in the wake of the CCs and the advance squadron.

The 92d Squadron was designated to seize the crossings over the Danube; the 101st, to move south and clean up enemy resistance along the Aalen-Nordlingen highway in the western portion of the Division zone; the 116th, to mop up resistance remaining in the area by-passed by the 101st Squadron.

The 92d Squadron moved south early April 22 against very strong resistance. By nightfall the Squadron had reached the Eger River in zone but was prevented from crossing by fierce resistance from the south bank. The 116th Squadron cleared the enemy in its area and again assembled in reserve. The 101st Squadron, assisted by CC-R, cleared up its area. CC-A thrust through the hill masses to Dillingen and seized the bridge over the Danube intact, and established a limited bridgehead on the south bank. At dark April 22, the 101st Squadron was directed by the CO, 101st Group, to move south immediately and seize Danube River crossings in the Lauingen area west of Dillingen. After a bold, night march the Squadron seized and occupied Lauingen by 2330. The enemy, however, had destroyed all bridges over the Danube before they could be taken.

While CC-A and the 101st Squadron consolidated in their areas April 23, the 92d Squadron crossed the Eger River and proceeded south. The enemy resisted strongly at the entrances to the Danube River plain. Artillery fire was placed on the retreating enemy columns with good effect, and after prolonged fighting, the 92d Squadron reached the river area—but the enemy had been able to blow all bridges before they could be seized. CC-B reached Hockstadt, but likewise was unable to seize bridges before they were destroyed. The Dillingen bridge remained the only intact crossing in the Division area.

South of the Danube

During the period April 23-25 operations were concerned with protection of the flanks of the Division, and the extension of the bridgehead area. The 92d Squadron crossed to the south bank and reconnoitered to the south and southwest, and seized bridges over the Mindel River at Burgau and on the autobahn south of Burgau, which facilitated the movement of CC-B along the south bank of the river. Considerable enemy activity was observed on the wooded heights west of Burgau.

The 42d Infantry Division reached the Danube on the Division's left and took Donauworth. The 63d Infantry Division reached and crossed the Danube on the Division's right. During the night April 25-26, the enemy counterattacked the 63d Division bridgehead in force. The 92d Squadron held its bridges throughout the night, and fought off a sharp counterattack at Burgau the next day. The other squadrons of the Group, and Group Headquarters, crossed and assembled on the south bank. The Group was directed to extend reconnaissance to the south.

While constantly probing at the enemy positions in its area the 92d Squadron found a gap in the defenses on the east bank of the Mindel River. Routes farther east were held in force, and the enemy on the west bank of the Mindel in the vicinity of Burgau were sticking firmly to their positions. The 116th Squadron relieved the 92d at the Mindel River bridges, and the 92d raced south along the east bank of the Mindel for about 15 kilometers and then turned east behind the enemy MLR, and assembled at Ziemetshausen. At 1400 a combat patrol from the 92d Squadron, operating east of Ziemetshausen, intercepted a German officer courier from the 13th SS Corps. Among the top secret documents captured was a marked map showing enemy operations for April 26. The map showed that three divisions had been committed to the attack of the 63d Division bridgehead, and that a fourth division was defending in the Group zone. The Mindel River was marked as the boundary between adjacent Corps. Confusion as to responsibility for the defense of that corridor had apparently resulted in the gap found by the 92d Squadron. (The map and other documents captured were promptly forwarded to 12th Armored Division headquarters.)

In exploit of its success, the 92d Squadron was directed to continue south and seize crossings over the Wertach River at Hiltenfingen and Siebnach. Overcoming strong rear area defenses, the Squadron raced to the Wertach and took intact the bridge near Hiltenfingen at 2000. By 2120 the town and two additional bridges over smaller streams were secured.

The 101st Squadron, moving south in its zone to the left of the 92d, battled its way through wooded areas, finding enemy resistance extremely determined. The Squadron crossed the Augsberg-Ulm autobahn and continued its advance throughout the night, having been directed to seize bridges in the area of Gross Aitingen on the Wertach River. The 116th Squadron mopped up resistance in the area between the Mindel valley and the 101st Squadron zone, and captured a large quantity of airplanes, and an underground airplane parts factory. The Squadron then moved south during the night to assist the 92d Squadron at the bridgehead over the Wertach. CC-A also moved south that night to relieve elements of the Group at the bridgehead. Just before daylight April 27, CC-A arrived at the Wertach. The Group was directed to proceed south with all available troops and seize crossings over the Lech River. The CO of the 101st Group assigned the bridges in the vicinity of Landsberg to the 92d Squadron, and those in the vicinity of Schwabstadl to the 116th Squadron. All bridges over the Lech in zone were found to have been destroyed, and both squadrons made a detailed reconnaissance of the west bank and recommended the repair of bridges and of sites suitable for the construction of new bridges. Meanwhile, the 101st Squadron continued to move south and at midday seized intact the Wertach River bridge at Gross Aitingen.

The Division then was given the mission of continuing southeast to seize and hold Weilheim and Bad Tolz, and deny the enemy the use of passes into the Bavarian Alps in that area. Large enemy concentrations had been reported in Munich and vicinity. The plan directed CC-A—preceded by a squadron of cavalry—to block the passes south of Weilheim and Pennsberg; CC-B to block the passes south of Bad Tolz. The remainder of the Group was to advance to the east and southeast, block exits from Munich in that direction, and protect the Division left flank. The 116th Squadron was assigned to the mission with CC-A, and the blocking line was divided between the 92d and 101st Squadrons.

A partially destroyed railroad bridge near Landsberg was repaired during the night of April 27-28 by Division engineers. The 116th Squadron began crossing at 0600 April 28, against scattered small-arms fire and unobserved artillery fire. The Squadron made good progress through Landsberg, and to a point about 20 kilometers southeast (approximately halfway to Weilheim) where stiff opposition was encountered. Attempts to bypass were unsuccessful and forward movement was halted at dark. During the night, elements of the squadron moved east by secondary roads to the vicinity of the Ammer See.

Followed by the 92d Squadron, the 101st Squadron crossed the bridge after the 116th, and moved east on its mission. Poor roads and demolitions forced the Squadron to detour to the south and return north along the west bank of the Ammer See, with the intention of securing and using the causeway across the northern tip of the See. Progress was delayed by an enemy attack in which were employed four Tiger Tanks and a substantial number of infantry. At dusk, as forward elements of the squadron were approaching the causeway, the enemy detonated prepared charges and literally blew up the road in the faces of the advancing units. The Squadron deployed and outposted the Amper River line for the night. The 92d Squadron did not complete the crossing until late April 28, because of delays in the crossings of the other two Squadrons and the continuous delays for bridge repairs. The crossing finally completed, the Squadron moved east and assembled in support of the 101st Squadron.

Early April 29, Troop A, 116th Squadron, moved around the southern tip of the Ammer See and reached the main highway that joined Diessen and Weilheim. The troop raced east, and from a surprised enemy captured the bridges over the Ammer River. Troop B advanced through the opposition along the original route, captured the bridge over the Ammer River at the western edge of Weilheim, and at 1100 secured the town. In the meantime, the rest of the Squadron fought against resistance along the alternate route taken by Troop A. CC-A, which had crossed the bridge during the night, began entering Weilheim at 1130.

That afternoon the mission of CC-A and the 116th Squadron was changed: they were to move through the mountain passes south of Weilheim and secure Innsbruck. Since the bulk of the Squadron was being delayed by the fighting north of Weilheim, Troop B, already in Weilheim, was detached from the Squadron and attached to CC-A in order to avoid delay. The force moved out at once and before dark had progressed about 20 kilometers south against varying resistance. The mission was cancelled the following day and Troop B later rejoined the Squadron.

Within the next few days, the operation plans were modified by the changing situation, and by the arrival from the north of other friendly units. Before being relieved from attachment to the 12th Armored Division on May 4 units of the Group conducted an intensive reconnaissance of the water barriers in the area east of Weilheim, and performed patrol and security missions for the Division.

During the course of the long drive south from the Danube, the Group, operating with three squadrons, had found the gap in the defenses south of the Danube and poured south, extending the area of operations of the Division from Dillingen to Landsberg and thence to Weilheim—an advance of roughly 130 kilometers. Several important bridges were seized intact, and were held until they were taken over by the rapidly advancing units of the Division. Security was provided for the Division flanks, enemy supply and communication routes disrupted, and large quantities of matériel captured or destroyed.

During this latter phase in which the attack developed into an extended pursuit, the Group was able to use the mobility inherent in mechanized cavalry to excellent advantage. The rapidity with which the armored units arrived at each vital point allowed the Group to maintain the momentum of its continuous thrust and to keep the enemy off-balance.

To Newly Organizing Armored Divisions and Mechanized Cavalry Unit Associations

Many armored divisions and mechanized cavalry units today are forming associations.

To those who have already formed such associations—and to those who are contemplating the formation of such organizations in the future—The Cavalry Journal wishes to offer its services. The facilities of the magazine are open, without charge, to publicize the activities or any other matters which the associations desire to bring to the attention of our readers.

We would be very glad to publish the name of each new association as it is formed, with the address of its headquarters or officials, which, we believe, will help with the establishment of the associations.

Write to The Cavalry Journal, 1719 K Street N.W., Washington 6, D. C., if we can be of any assistance.

The 316th Provisional Mechanized Cavalry Brigade in Combat

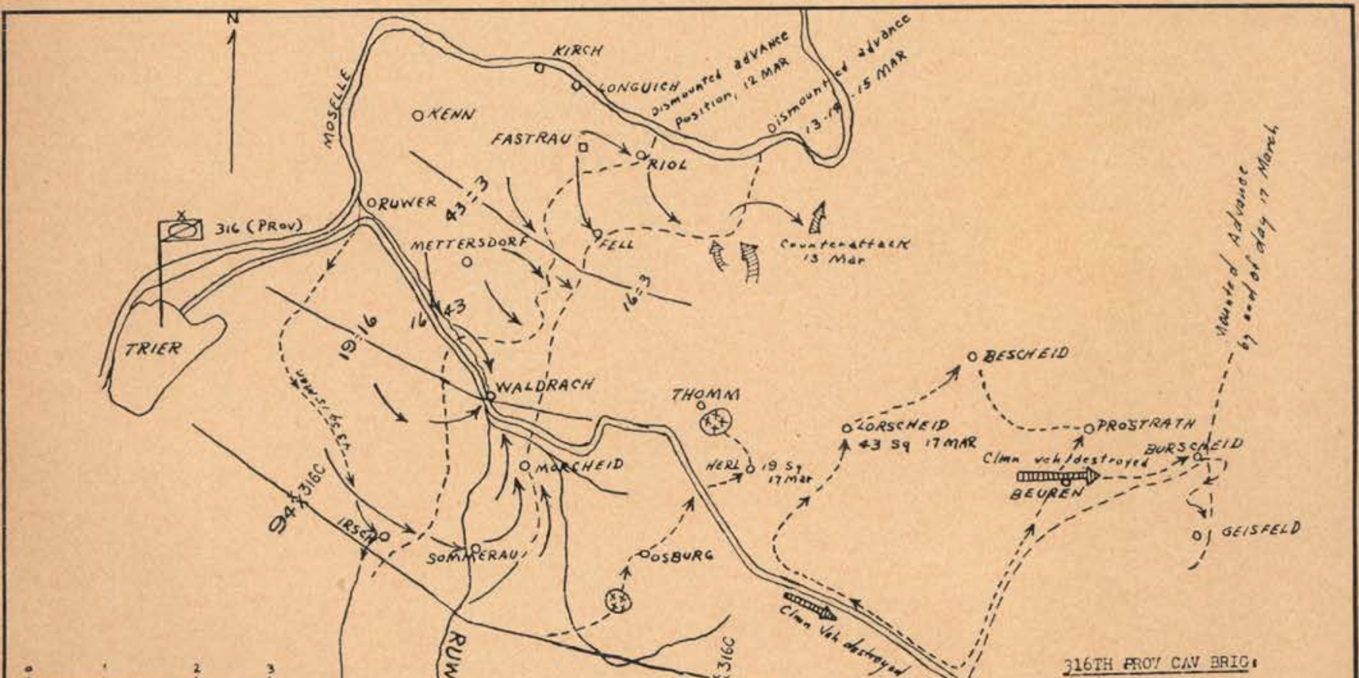
FIRST OF A SERIES

ON March 8, 1945, the 3d Cavalry Group of the XX Corps, composed of the 3d and 43d Cavalry Reconnaissance Squadrons, was in the area south of the Moselle River just east of Trier. It was in the process of taking over the positions held by the 417th Infantry Regiment. For several days it was occupied mainly in securing a suitable line of departure for participating in an offensive operation being prepared by the corps.

In order to assemble the 94th Infantry Division in preparation for this offensive, XX Corps was obliged to leave a wide gap between its left (north) flank and the XII Corps, then north of the Moselle River. Mechanized cavalry was the ideal arm with which to fill the gap and to conduct an offensive in this zone. To augment the mechanized cavalry strength of the corps in preparation for such an operation, therefore, Third Army attached to the XX Corps an additional group, the 16th, composed of the 16th and 19th Cavalry Reconnaissance Squadrons. This group had had no previous combat experience, and so in order to insure coördination of the mechanized cavalry effort, the corps commander decided to form a provisional cavalry brigade for the execution of this mission, and to give it the experienced leadership of Colonel James H. Polk, commanding officer of the 3d Cavalry Group. Accordingly, by corps order of March 9, the 316th Provisional Cavalry Brigade, comprising the 3d and 16th Cavalry Groups, was constituted. Also attached to the brigade were the 241st Field Artillery Battalion, the 245th Engineer Combat Battalion, Company A 818th Tank Destroyer Battalion (SP), and an air support party. The 416th Field Artillery Group was to be in direct support, and the 558th Field Artillery Battalion in general support.

The brigade's mission was to attack in conjunction with the corps, to protect the XX Corps' north flank, and to maintain contact with the 94th Infantry Division on the south. The projected date for the attack was March 13.

Upon its arrival from Veckering on March 12, the 16th Cavalry Group was given the mission of taking over the right of the brigade's sector from the 43d Cavalry Reconnaissance Squadron, and of maintaining contact with the 94th Infantry Division. Accordingly, on the day before the attack, the brigade was disposed with cavalry groups abreast, the 16th Cavalry Group on the right. In each group, squadrons were disposed abreast, so that the brigade front was, in order from right to left: the 16th and 19th cavalry reconnaissance squadrons, from a draw on the south (the north boundary of the zone of action of the 94th Infantry Division), north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KIRCH
LONGUICH
dismounted advance position, 12 MAR
dismounted advance 13-14 15 MAR
MOSELLE
KENN
FASTRAU
RIOL
RUWER
43 3
316 (PROV)
METTERSDORF
FELL
Counterattack 13 Mar
16 3
16 43
19 16
TRIER
WALDRACH
THOMM
BESCHEID
LORSCHEID
43 Sq 17 MAR
PROSTRATH
BURSCHEID
Clmn veh/destroyed
BEUREN
HERL
19 Sq 17 Mar
MORSCHEID
94 316C
IRSCH
SOMMERAU
OSBURG
GEISFELD
Mounted Advance by end of day 17 March
Clmn Veh destroyed
RUWER
0 1 2 3
miles
94 316C
FORD
GEIZENBURG
43 Sq 16 Mar
REINSFELD
316TH PROV CAV BRIG.
Attack, E. of TRIER, on North Flank of XX Corps 10 - 17 March 1945

to the Ruwer River; and the 43d and 3d cavalry reconnaissance squadrons from the Ruwer River north to the Moselle River. The width of the front was approximately seven miles.

The primarily dismounted phase of the attack began March 13 and continued through March 15. As it progressed, the 43d Cavalry Reconnaissance Squadron was pinched out and passed into brigade reserve; its sector was taken over by the 16th Cavalry Reconnaissance Squadron. When the advance reached the Ruwer River, all bridges were found destroyed. The 94th Infantry Division, however, discovered a ford near Geizburg, and on March 14-15 the 19th Cavalry Reconnaissance Squadron sent tanks across to support its dismounted attack on Sommerau and Morcheid. On March 16-17, when the 94th Infantry Division had taken Reinsfeld, the 43d Cavalry Reconnaissance Squadron was sent mounted across the ford to attack north from that point. By the end of March 17, it had advanced as far north and east as Burtscheid.

The terrain in the brigade's zone of action, in the foothills of the Hunnsbruck Mountains, was found difficult for mechanized cavalry operations. The streams and high, heavily wooded ridges ran generally north and south, perpendicular to the direction of advance. The enemy's defensive and delaying tactics were therefore favored, and he was afforded excellent observation posts for directing artillery fire.

In the attack, the main effort was invariably made with the cavalry reconnaissance troops advancing dismounted, closely supported by the light tanks, tank destroyers and engineers. The light tanks and tank destroyers were brought up in defilade and supported the attack with fire, or stood by for use in the assault. The engineers attached to the cavalry troops were employed to remove road blocks and to clear the minefields. The assault guns were generally employed in battery in close support of the attack; and through the air support party, attacks by light bombers were arranged against enemy-occupied towns prior to their assault by the mechanized cavalry.

In the assault, mechanized cavalrymen, mounted on tanks, were employed in the same manner as tank-infantry teams. When a town or high ground was seized, it was immediately organized for all-round defense. As the roads were opened by the capture of the towns and high ground along their routes, the mechanized cavalry troops sent out rapidly moving mounted teams to cut off and harass the retreating enemy.

On March 18, after the corps offensive had been successful, and the enemy had started a withdrawal along the entire front, the provisional cavalry brigade was dissolved. The 3d Cavalry Group, which had been committed without rest for more than three months, was withdrawn to Trier in SHAEF reserve, and the 16th Cavalry Group assumed full responsibility in the zone.

Thus, over a period of eight days, a mechanized cavalry brigade had fought on a seven-mile front against stiff opposition and over difficult terrain, and had advanced 10 miles while inflicting many enemy casualties. An important road that ran through the zone had been opened, and the way had been cleared for a combat command of the 12th Armored Division to exploit the 94th Infantry Division's attack.

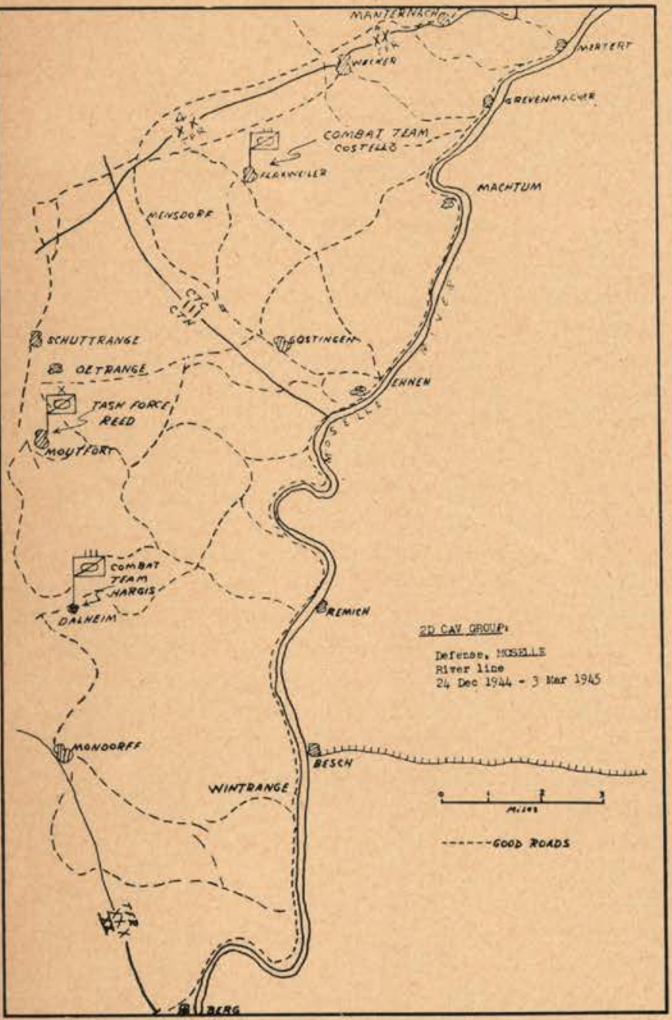
* * * *

The 2d Cavalry Group

Defense of the west bank of the Moselle River, in the Mountfort Area, Luxembourg, December 24, 1944–March 3, 1945.

ON December 23, 1944, the 2d Cavalry Group received the mission of protecting the right (east) flank of XII Corps along the west bank of the Moselle River in an area from Haute Kontz on the south to Mertert on the north. All enemy pockets on the west bank of the Moselle were to be reduced and the enemy held east of the Moselle within the sector. Contact was to be gained and maintained with XX Corps on the right and with the 4th Infantry Division on the left along a front of 25 miles. In this sector, the Moselle River was from 500 to 600 feet wide and up to 25 feet deep. On the west bank, the hills rose steeply to a height of 450 meters; on the east bank, the slope was gradual. This bank was known to be held by enemy infantry and fortress machine-gun battalions which were generally unaggressive except for patrols. Two enemy bridgeheads existed within the sector on the west bank, one at Machtum and the other at Mertert. There was also an enemy bridgehead at Wasserbillig, two kilometers from the north boundary of the sector.

The corps commander constituted the group as Task Force Reed, and he attached to it the following units: 372d and 398th Engineer (GS) Regiments, 808th Tank Destroyer Battalion (3-inch, towed), 255th Field Artillery Battalion (105mm howitzer), 276th Armored Field Artillery Battalion, and one signal platoon. The engineer regiments were to be used as infantry. For execution of the mission, the task force was disposed as follows (see sketch): Combat Team Hargis, comprising the 42d Cavalry Reconnaissance Squadron (less Troop E and Company F), one battalion of the 372d Engineer (GS) Regiment, and one tank destroyer company, on the right; Combat Team Costello, comprising the 2d Cavalry Reconnaissance Squadron (less Troop E), 398th Engineer (GS) Regiment, and one tank destroyer company, on the left. The remainder of the force was to be in reserve at Mountfort.



Three defensive lines were organized as follows: an outpost line, held by 11 platoons, on the riverbank; a support line, manned by 18 platoons, along the hills from 1,000 to 2,000 yards west of the river; and a reserve line, not occupied, on the commanding ground two to three miles from the Moselle River. Numerous obstacles were erected, fires were carefully prepared, and an elaborate communications system was established.

Aggressive patrolling into the Mertert and Machtum bridgeheads was initiated immediately and resulted in the withdrawal across the river of the force at Mertert. A dismounted attack that was supported by tanks drove the enemy from the high ground adjacent to Machtum on December 30. On January 11, Troop C of the 2d Cavalry Reconnaissance Squadron attacked dismounted and, after 12 hours of street fighting, cleared the town. Patrolling across the Moselle River was also undertaken, and on February 19, an offensive operation was executed east of the river. Supporting artillery, with the assault gun troops attached, was active day and night. It was possible to rotate organizations frequently, and health and morale remained excellent.

To summarize this operation of the 2d Cavalry Group: a force of some 5,500 successfully defended a front of over 25 miles for more than two months, thus releasing an infantry division for offensive combat; mechanized cavalry, with its mobility and excellent communications, demonstrated its suitability to defend long river lines, with infantry, artillery and engineer support.

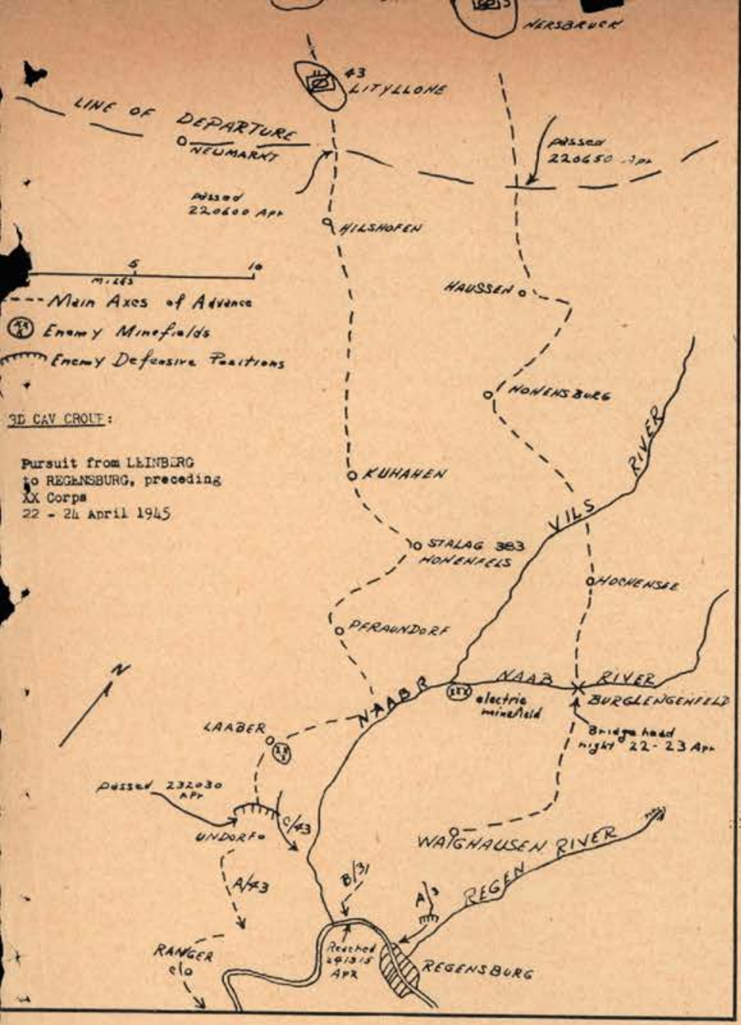
* * * *

The 3d Cavalry Group

Pursuit from Leinberg to Regensburg, preceding the XX Corps, to seize crossings over the Danube River, April 22-24, 1945.

ON April 21, 1945, the 3d Cavalry Group, composed of the 3d and 43d cavalry reconnaissance squadrons, was disposed as shown on the accompanying sketch. The mission then assigned to XX Corps, to which the group was attached, was to begin an advance southeast in assigned zone early on April 22, and to make contact with Soviet Army troops which were reported moving west from Vienna. The 3d Cavalry Group, with Companies A and C, 811th Tank Destroyer Battalion (SP), Company A, 245th Engineer (C) Battalion, and the 5th Ranger Battalion, attached, and with the 274th Armored Field Artillery Battalion in direct support, was given the mission to pursue vigorously the routed German forces southeast to Regensburg, and to seize and hold the bridges across the Danube River in the corps' zone. The group was to be followed by the 65th and 71st Infantry Divisions, advancing abreast, with the 65th on the right.

The group commander decided to move with squadrons abreast, the 43d on the right. The Vils River when



---Main Axes of Advance
Ⓧ Enemy Minefields
Enemy Defensive Positions

3D CAV CROUP:

Pursuit from LEINBERG
to REGENSBURG, preceding
XX Corps
22 - 24 April 1945

reached was to become the boundary between squadrons. Isolated enemy centers of resistance were to be reported and by-passed, and organized enemy defensive positions were to be developed. The 43d Cavalry Reconnaissance Squadron—with three companies of the 5th Ranger Battalion, Company C 811th Tank Destroyer Battalion (SP), and one platoon of Company A 245th Engineers (C) attached, and with one battery of the 274th Armored Field Artillery Battalion in direct support—was to pursue in its zone, and maintain contact with the 65th Infantry Division, which was to follow. The 3d Cavalry Reconnaissance Squadron, on the left—with the 5th Ranger Battalion (less three companies), Company A 811th Tank Destroyer Battalion (SP), and Company A (less one platoon) 245th Engineer (C) Battalion, attached, and with the 274th Armored Field Artillery Battalion (less one battery) in direct support—was to pursue in its zone and to maintain contact with the 71st Infantry Division, following in its rear, and was to seize and hold all bridges over the Naab River found intact, Group headquarters was to move with the west column.

At 0600 hours April 22, the advance began. The weather was cloudy and cold, and there was rain and snow. The terrain was mountainous and wooded, and the roads muddy and occasionally, although shown on the map, nonexistent. The advance was slowed by road blocks and minefields, a great many of which were defended by small arms and automatic weapons and in some instances were supported by the antitank fire from 20mm and 88mm guns.

The 43d Cavalry Reconnaissance Squadron encountered one organized enemy defensive position, which it developed and penetrated. It also overran a German Stalag and released over 2,000 Allied prisoners of war. The 3d Cavalry Reconnaissance Squadron seized a bridge across the Naab River and held it until the Infantry came up 24 hours later and relieved it. By the afternoon of the third day, both squadrons had reached their objective, the Danube River. Approximately 2,000 POWs had been taken and an unknown number of casualties inflicted on the enemy.

The following were the principal results of this operation: the enemy was routed before he could organize a defensive stand north of the Danube; the seizure of the bridge across the Naab River assisted the advance of the left division; and the operation set the stage for XX Corps' assault on Regensburg.

* * * *

The 4th Cavalry Group

Screening the VII Corps' right flank, south of Aachen, September 16–October 2, 1944.

ON September 15, 1944, the 4th Cavalry Group, composed of the 4th and 24th cavalry reconnaissance squadrons—with the 759th Light Battalion (less Company A), the 87th Armored Field Artillery Battalion, the 635th Tank Destroyer Battalion (3-inch, towed) and Companies A and C of the 297th Engineer (C) Battalion attached—was given the mission of screening the right (south) flank of the VII Corps in its attack on the Siegfried Line near Aachen.

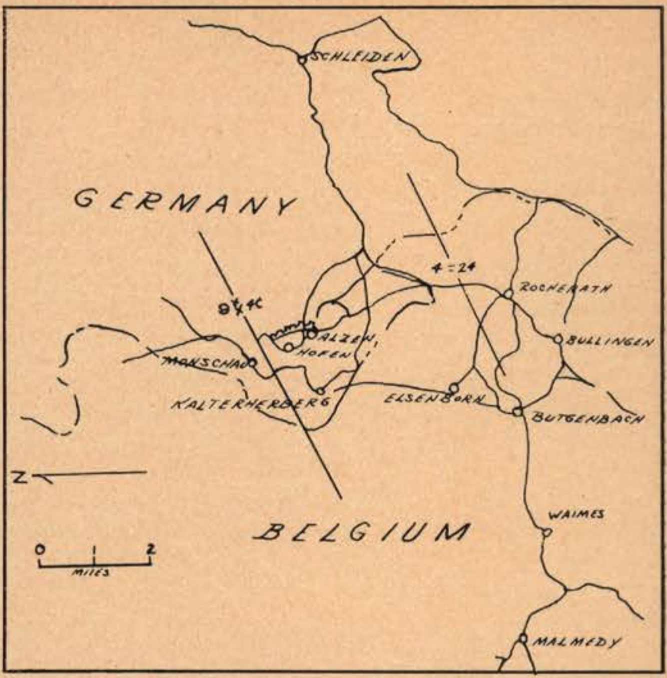
On September 16, the group, with squadrons abreast, was disposed as follows (see sketch): the 24th Cavalry Reconnaissance Squadron was on the right, with an engineer platoon attached, and one light tank company in direct support; the 4th Cavalry Reconnaissance Squadron was on the left, with an engineer company and a treadway bridge detachment attached; the 87th Armored Field Artillery Battalion was in position just west of Bullingen, in direct support of both squadrons.

Group headquarters and the remainder of the force were in Butgenbach.

The terrain south of Aachen was hilly and densely wooded. The weather was cold, and there were heavy fogs in the late evening and in the early morning. Because enemy fortifications and the extremely dense woods made vehicular movement impracticable, the group commander directed that both squadrons send out aggressive dismounted patrols to the east.

These patrols on the first day encountered the outer fringes of the Siegfried Line. The defenses consisted of road blocks, sited in depth, and in most cases booby-trapped and covered by small-arms fire. Numerous enemy patrols were working in the surrounding woods. The cavalry patrols were accompanied by elements of the attached engineers which removed the booby traps, and reduced the road blocks after they were captured. One company of light tanks was used to patrol the road between Butgenbach and Kalterherberg.

On September 17, the 4th Cavalry Reconnaissance Squadron repulsed an enemy counterattack by an estimated 100 infantrymen, and on September 18—when the sector was enlarged to a width of 12 to 15 miles to include the towns of Hofen and Alzen—the 24th Cavalry Reconnaissance Squadron also repulsed a counterattack by a company of infantry. Cavalry patrols were successful in locating enemy defensive positions, and through these efforts a valuable file of enemy information was compiled.



The roving tanks played an important rôle in denying enemy patrols entry through the gaps which existed on the wide front. Furthermore, the deception created through the continued movement of armored vehicles and the interdictory fires laid down by the assault guns, artillery howitzers and tank destroyer guns, created the illusion of greater strength than actually existed. The fact that on October 1 an entire corps (V Corps) began taking over the sector of the 4th Cavalry Group is felt to have been proof of the magnitude of the unit's accomplishment.

* * * *

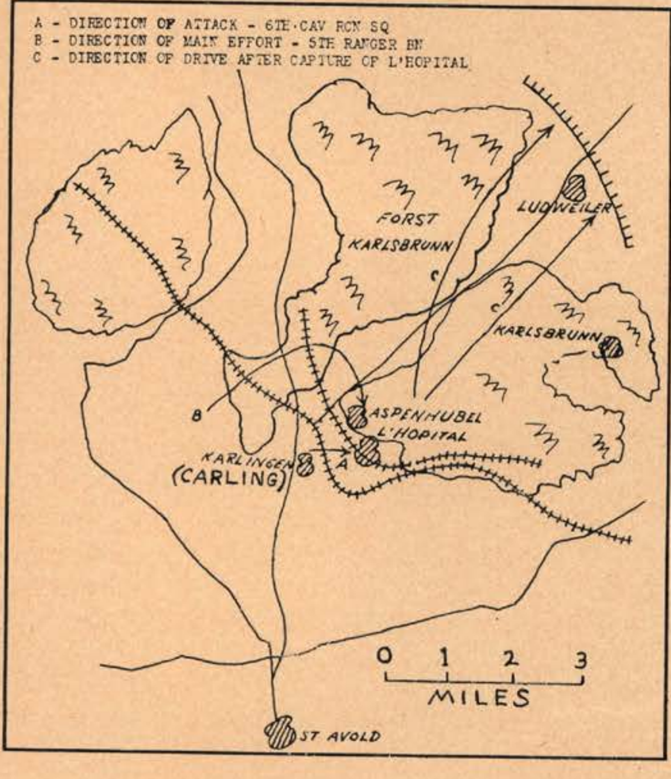
The 6th Cavalry Group

Attack to seize L'Hopital and clear Karlsbrunn Forest, December 2-5, 1944.

On December 1, 1944, the 6th Cavalry (less 28th Cavalry Reconnaissance Squadron), reinforced by 5th Ranger Battalion, Company C 602d Tank Destroyer Battalion and Company B 293d Engineer (C) Battalion, was attached to XX Corps and given the mission of: protecting the right flank of the corps; breaching the German line of defense at L'Hopital; and clearing the forest of Karlsbrunn to the northeast. The 6th Cavalry Group promptly moved into an assembly area northeast of Saint Avold. The 6th Cavalry Reconnaissance Squadron, with Company D 5th Ranger Battalion attached, relieved one battalion of the 10th Infantry Regiment in Carling and made plans for a frontal assault on L'Hopital, which was separated from Carling by a deep railway cut. Meanwhile, the 5th Ranger Battalion (less Company D), which was to make the main effort on the left, moved into an assembly area northeast of Carling under the cover of woods.

The attack was to begin at 0830 hours December 2, and artillery support was to be provided by the 5th Infantry Division, but because of a lack of time this arrangement had not been completed. Actually, the attack of the ranger battalion, reinforced by light tanks, started at 0900 hours. The tanks, however, could not be used effectively because of the deep mud, and the battalion soon came under heavy artillery and automatic weapons fire. As a result, its attack was temporarily halted after it crossed the railroad track. In the meantime, the 6th Cavalry Reconnaissance Squadron was engaged along the railroad cut between Carling and L'Hopital.

During the night of December 2-3, 1944, the 6th Cavalry Reconnaissance Squadron pushed across the railroad cut and entered the southern edge of L'Hopital, where they came under heavy artillery and mortar fire. After clearing a portion of the town an enemy counterattack inflicted heavy casualties and forced them to withdraw to the railroad embankment. Meanwhile, the main attack by the 5th Ranger Battalion advanced slowly through the woods to the northeast of L'Hopital. December 4 was spent in advancing the ranger battalion and in making arrangements to receive artillery support from the 19th Field Artillery Battalion, 5th Infantry Division. Early December 5, after a heavy artillery preparation on L'Hopital, the town was captured and cleared by a combined attack of the 6th Cavalry Reconnaissance Squadron and the 5th Ranger Battalion. The cavalry attacked east across the railroad while the rangers drove in from the northeast. The vigor of the attack carried the 6th Cavalry Reconnaissance Squadron through the enemy supports and well into the forest of Karlsbrunn. As a result, enemy artillery was forced to displace and, freed from artillery fire, the 6th Cavalry Group quickly cleared the forest and gained the high ground to the east.


A - DIRECTION OF ATTACK - 6TH·CAV RCN SQ
B - DIRECTION OF MAIN EFFORT - 5TH RANGER BN
C - DIRECTION OF DRIVE AFTER CAPTURE OF L'HOPITAL
FORST
KARLSBRUNN
LUDWEILER
C
C
KARLSBRUNN
B
ASPENHUBEL
L'HOPITAL
KARLINGEN
(CARLING)
A
0 1 2 3
MILES
ST AVOLD

The action was almost entirely dismounted—armored car, tank and destroyer support being difficult due to the heavy mud and the steep approaches to the railway embankment. The attacking forces were initially handicapped by lack of sufficient time for making reconnaissance and for arranging for artillery support. When these difficulties had been overcome, however, the objectives were gained without undue losses, and the attack was strongly pushed. This action illustrates the handicap under which mechanized cavalry forces were placed when operating dismounted without their normal mobile fire support. It also, however, illustrates the ability of mechanized cavalry to overcome that handicap, when reinforced with infantry and aggressively led.

* * * *

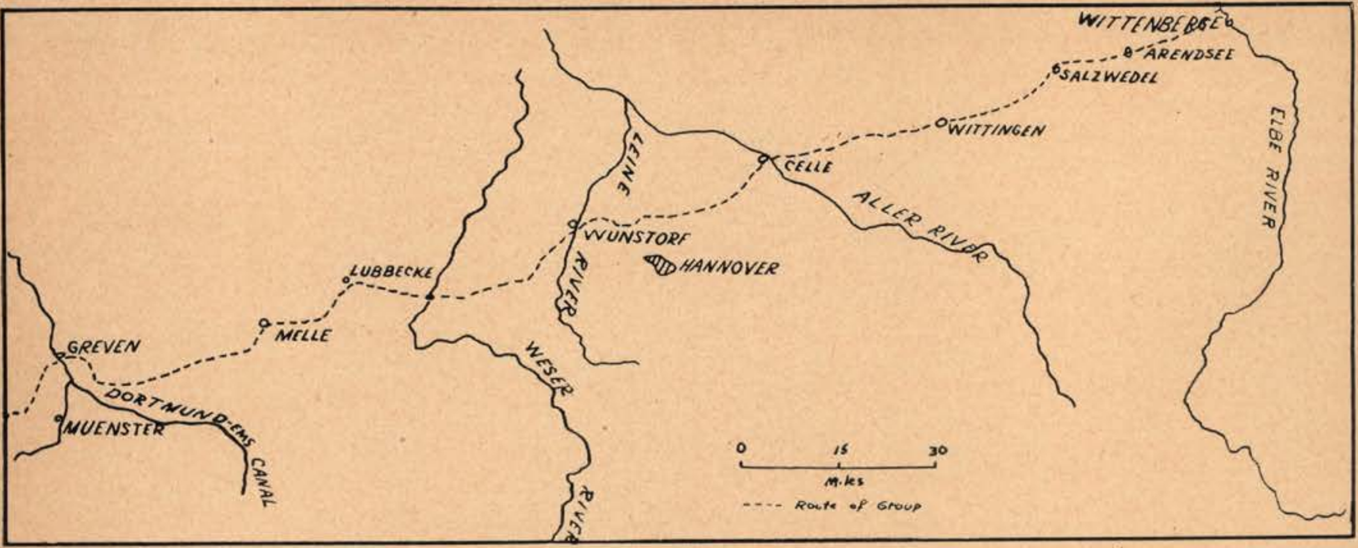
The 11th Cavalry Group

Protection of the north flank of the XIII Corps during the advance from the Rhine to the Elbe rivers, April 2-15, 1945.

ON April 1, 1945, the 11th Cavalry Group, to which was attached the 771st Tank Destroyer Battalion, was assembled near Rorup, about 15 miles west of Muenster, and was attached to XIII Corps, the left corps of Ninth Army. The group was given the mission of protecting the left (north) flank of the XIII Corps from Coesfeld to the east, and of maintaining contact with the Second British Army on the left. This mission was initiated early April 2. In its execution, up to April 15, the 11th Group travelled about 225 miles.

Although the group's mission was one of security, its performance required much offensive combat. The stiffest enemy resistance was met north of Muenster, after the crossing of the Dortmund-Ems Canal, and north of Hannover, at the crossing of the Leine River; but throughout the advance, it was necessary for the 11th Cavalry Group to fight its way into all the towns which lay in its path.

Maintaining contact with the Second British Army was difficult. As far east as Hannover, American and British forces were in close proximity. However, one and then the other was in the lead, and the task became mainly one of coördination; for example, just west of Hannover, a British unit came into a town from the north as the 11th Cavalry Group entered it from the west. Again, just north of Hannover, the route taken by the 11th Cavalry Group was identical with one assigned to a British reconnaissance unit. After Hannover had been passed, however, British elements turned north toward Hamburg, and so a considerable gap was developed which measured from a few to as many as 50 miles. During this period, contact with the British was



maintained through personal visits by the squadron commander and members of his staff, and by an officer-radio liaison team. This liaison was maintained until the group reached the Elbe River.

The 11th Cavalry Group was employed tactically as follows: Squadrons, with a tank destroyer company attached to each, were disposed abreast in sectors facing generally north. Upon group order, the western squadron would move east on a route passing to the south of the eastern squadron, and fight its way to occupy a sector farther east, and this movement was so timed as to insure the arrival of the squadron on its new line in time to protect the north flank of the leading elements of the 84th Infantry Division. (This unit was the left division of XIII Corps, which was advancing east in a zone immediately to the south of the 11th Cavalry Group.) Each squadron habitually employed three task forces or teams, each composed of a cavalry reconnaissance troop, with a platoon of light tanks, a platoon of assault guns and a platoon of tank destroyers attached. The order of march of these teams was alternated during the squadron's advance to its new sector.

This operation illustrated the marked ability of mechanized cavalry to cover open flanks, and to maintain contact with adjacent units in fast-moving action.

* * *

A series of articles on the employment of cavalry in combat in the European Theater, of which the above articles are a part, will be continued in forthcoming editions of *The Cavalry Journal*. Remaining articles include:

113th Cavalry Group: Reconnaissance of the XIX Corps' zone of action, L'Escaut Canal to Albert Canal, September 5-8, 1944.

113th Cavalry Group: Defense of the north flank of the 12th Army Group, Sittard area, September 19—November 12, 1944.

2d Cavalry Reconnaissance Squadron: Crossing of the Moselle River and seizure of Wincheringen as a diversion for an attack by the XX Corps, February 19, 1945.

38th Cavalry Reconnaissance Squadron: Defense of the Monschau area against German attack, December 16-17, 1944.

78th Cavalry Reconnaissance Squadron: Attack against Meinkenbracht, April 12, 1945.

86th Cavalry Reconnaissance Squadron: Screening of the 6th Armored Division, near Muehlhausen, April 5-12, 1945.

89th Cavalry Reconnaissance Squadron: Delaying action by Troops A, B, C and E, Befort area, December 16-25, 1944.

92d Cavalry Reconnaissance Squadron: Reconnaissance for the 12th Armored Division, Neustadt area, April 8-16, 1945.

80th Cavalry Reconnaissance Troop: Reconnaissance during advance of the 80th Infantry Division to Kassel, April 1-3, 1945.

104th Cavalry Reconnaissance Troop: Attack from Borgentreich area to Weser River in advance of the 104th Infantry Division, April 7, 1945.

CARDED

U.S. Cavalry in the ETO

The assignments and attachments of Mechanized Cavalry Groups and of separate Mechanized Cavalry Reconnaissance Squadrons, and the campaigns in which they participated, in the European Theater of Operations.

Group	Normally Attached Squadrons	Date Entered Active Combat In ETO As Group	Army(ies) to Which Assigned	CORPS TO WHICH ATTACHED					
				CAMPAIGNS					
				Normandy	Northern France	Southern France	Ardennes	Rhineland	Central Europe
2d		July 19, 1944	Third	ADSEC	VIII XII		XII XX	XII	XII
	2d		Third	ADSEC	VIII XII		XII XX	XII	XII
	42d		Third	ADSEC	VII XII		XII XX	XII	XII
3d		Aug. 10, 1944	Third		XX		XX	XX	XX
	3d		Third		XX XII		XX	XX	XX
	43d		Third		XX		XX	XX	XX
4th		June 18, 1944	First	VII	VII		VII	VII	VII
	4th		First	VII	VII		VII	VII	VII
	24th		First	VII	VII		VII	VII	VII
6th		Aug. 2, 1944	Third	Army	Army		III	VIII	VIII
	6th		Third	Army	Army		III	VIII	VIII
	28th		Third	Army	Army		III	VIII	VIII
11th		Dec. 14, 1944	Ninth					XIII	XIII
	36th		Ninth					XIII	XIII
	44th		Ninth					XIII	XIII
14th		Dec. 11, 1944	First (until Apr. 18) Third				VIII	XVIII III	III
	18th		First (until Apr. 18) Third				VIII	XVIII III	III
	32d		First (until Apr. 18) Third				VIII	XVIII III	III
15th		July, 1944	Third (until Sept. 22) Ninth	ADSEC	ADSEC VIII			XVI	XIX XVI
	15th		Third (until Sept. 22) Ninth	ADSEC	ADSEC VIII			XVI	XIX XVI
	17th		Third (until Sept. 22) Ninth	ADSEC	ADSEC VIII Ninth Army			XIX XIII XVI Ninth Army	XIX XVI
16th		Mar. 10, 1945	Third (until April 1) Fifteenth					XX	XII XX XXII
	16th		Third (until April 1) Fifteenth					XX	XII XX XXII
	19th		Third (until April 1) Fifteenth					XX	XII XX XXII
101st		Feb. 9, 1945	Seventh					XV XXI	XXI
	101st		Seventh					XV XXI	XXI
	116th		Seventh					XV XXI	XXI
102d		June 12, 1944	First Seventh (Atchd. Mar. 16-28)	V	V		V VII XIX	V VI	V
	38th		First Seventh (Atchd. Mar. 16-28)	V	V		V	V VI	V
	102d		First	V	V		V VII XIX	V	V
106th		July 6, 1944	First (until Aug.) Third	VIII	XV XII		XV	XV	XV
	106th		First (until Aug.) Third	VIII	XV XII		XV	XV	XV
	121st		First (until Aug.) Third	VIII	XV XII		XV	XV	XV
113th		July 4, 1944	First (until Oct. 22) Ninth	XIX	XIX			XIX XIII	XIX XIII
	113th		First (until Oct. 22) Ninth	XIX	XIX			XIX XIII	XIX XIII
	125th		First (until Oct. 22) Ninth	XIX	XIX		Ninth Army	XIX XIII	XIX XIII
115th		Mar. 12, 1945	Fifteenth Seventh (Atchd. from Apr. 25)		66th Inf. Div.				VI
	104th		Fifteenth		66th Inf. Div.				
	107th		Fifteenth Seventh (Atchd. from Apr. 25)		66th Inf. Div.				VI
	117th	Aug. 15, 1944	Seventh			VI		VI	VI

ORDERS FOR THE DELIBER

by Colonel Hamilto

IN his articles in the *Infantry Journal,* Major General Orlando Ward warns repeatedly against leaning too heavily, in battle, on inspiration, suggests with much wisdom that practice among the various types of troops involved, and careful planning by higher echelons, are better assurances of success. Fruitful inspiration, he says, comes hard to the company officer when confusion and shell fragments become about equally thick.

Certainly many American attacks have failed altogether, or have failed partially, because of the lack of adequate tactical planning; additional others have failed because a plan, though proper, has not been adequately understood by subordinate commanders.

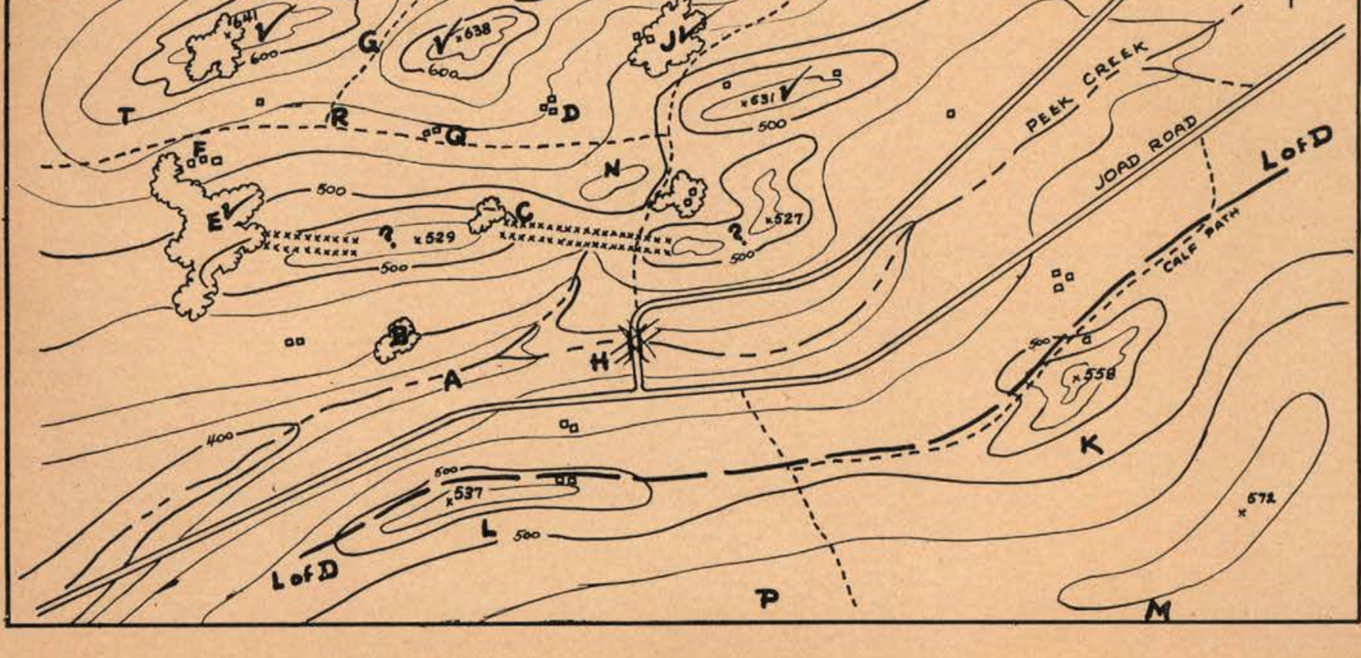
It will be acknowledged that no attack demands more careful planning nor more precise execution than the deliberate attack against a strongly prepared and strongly manned enemy position. Such a position normally is best taken by a sequence of intimately associated and accurately coördinated actions that methodically open the position to the attacker. Classic examples of expert planning, thorough practice, and superb execution are the German attack on Fort Eben Emael and the British attack at El Alamein, and some of our amphibious assaults deserve to be placed in the same high category. All these operations were preceded by repeated rehearsals.

It is obviously imperative, to effect the most overwhelming success, that each subordinate commander know what other commanders are doing, particularly

(*Colonel Howze was G-3 of the 1st Armored Division during most of the Tunisian campaign, and fought through the last actions in Tunisia as commanding officer of the 2d Battalion, 13th Armored Regiment. He was in command of the 13th Armored Regiment during the retraining period in North Africa, and the Italian campaign. Colonel Howze was awarded the* Silver Star, *the* Bronze Star, *and the* Legion of Merit.—EDITOR'S NOTE.)

in the matter of *time.* Once that it is settled, in the plan, that a certain system of attack is to obtain and a certain schedule is to be followed, the plan will gain tremendously in force if it is backed up by official, written orders, sufficiently detailed to insure understanding.

It is extremely difficult to get forth a detailed plan in the orthodox 5-Paragraph order, unsupported. Our present Paragraph 3 says, in effect, "Joe, do this, then do this, then do this, then do this and this," after which it tells Harry to "do that, then that, then that, and that and that"—and so on through all the units involved. Joe and Harry frequently have considerable difficulty



CARDED

ATE ATTACK

H. Howze, Cavalry

in seeing how the fifth "this" fits in with the sixth "that," particularly in point of time. It is very possible in fact, that the true connection between them will not be apparent at all.

The coördination of the various "thises" and "thats" are settled in conference by Harry and Joe, and their decisions and agreements, though possibly correct, are not backed up by *orders*. In the execution, Harry, if a little weak, may plead misunderstanding, and Joe's attack may break down because Harry didn't secure the little patch of woods on his right. No officer can have seen much fighting in the last war who did not observe such a thing, perhaps frequently.

The "Phase Plan"—so-called for lack of a better name—which is here proposed is in effect a chronological organization of orders, as against the usual system of presenting instructions to each unit in order as it appears on the troop list. A very rough analogy is the A F of L horizontal organization as against the CIO vertical scheme.

It is necessary to emphasize that such detailed planning—and consequent volume of paper—is suggested only when a fairly generous amount of time is available for its formulation, for conferences and critiques upon it, and for its eventual publication and dissemination in orders.

The phase plan is eventually issued in the form of a table. An idea of its form and usefulness can best be given by an example. Certain objections to the phase plan may spring to the mind of the reader—especially if he is an adherent to the very excellent principle of allowing proper independence to the subordinate commander. It is my contention that neither this nor any other military principle is in any way violated by this scheme, but I shall reserve details of discussion until the end of the article.

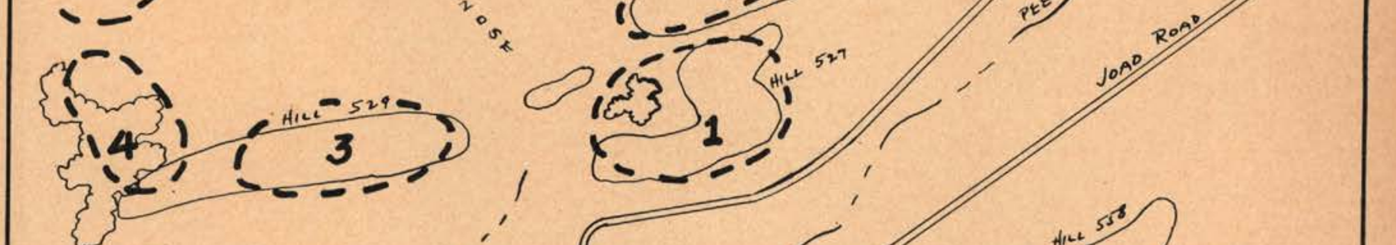
Situation: (See Sketch A).

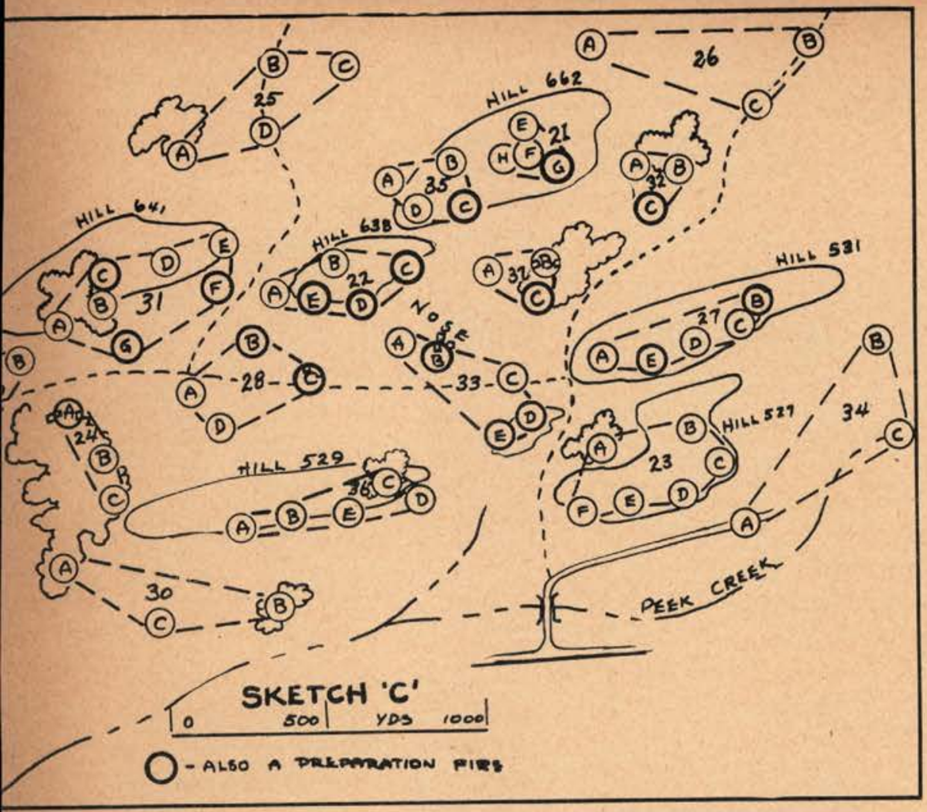
Blues (S) and Reds have been in present positions for a period of about one month.

Blues intend to launch a general offensive in about 10 days. In this sector, Blues occupy Hill 537, Hill 558, and the ridge south of these two.

Peek Creek is practically dry, but the bed is sunken and requires engineer work to effect tank crossings. The bridge at H is down.

Reds are known to occupy Hills 641, 638, 662, and 531 (each indicated by a check mark), houses at D, and woods at E and J. Question marks indicate features possibly held: our patrols have frequently visited Hills 529 and 527, and sometimes are engaged by MG fire or enemy patrols, and sometimes are not. On features known to be occupied by the enemy, various intelligence sources have located accurately a number of enemy field-works, but no one feels that *all* enemy locations are known. Similarly, a number of enemy mortar, artillery and *nebelwerfer* positions are known, but not all. Antitank minefields are known to exist approximately where indicated. The Red infantry strength in the sector is thought to be two battalions of about 400 each, reinforced by AT guns. Enemy reserves available within two hours: one infantry battalion, 15 tanks (estimated).





This indicates a method, somewhat contrary to normal artillery practice, of making up a sheet indicating the prearranged artillery fires on call to assault commanders. The scale should be identical to that of the tactical map issued to small unit commanders, but the paper may be opaque. Included on the sheet are certain landmarks and contours taken from the map: enough to identify at a glance each of the concentrations and concentration blocks. A quick comparison of this sketch and Sketch A will closely locate any concentration on Sketch A; this will be made doubly sure if the using officer will copy merely the outlines of the concentration blocks on his map, here represented by Sketch A. Too much artillery data placed directly on the map will of course obscure it.

Concentrations are not merely KNOWN enemy positions: they include POSSIBLE enemy positions plus certain BLOCKING concentrations to cover a flank: e.g., 29A and 29C will be useful to block enemy fire coming into the left flank of our troops moving north onto Obj. 5. Concentrations selected are grouped into blocks primarily according to the wishes of the over-all assault commander and the battalion commanders, with careful consideration of their schemes and maneuver.

Numbering the concentration blocks and lettering the concentrations will help legibility, it being unnecessary to cram a three-digit figure into a small, complaining circle.

Date of attack, June 1. Dawn is at 0500 hours. Weather expected fair. Ground firm.

The Blue Corps Commander has ordered a general counterbattery program to be fired from 0400 to 0500 on D Day. Preparation fires will be as directed by each sector commander. Limits for time of attack have been set by the Corps Commander: H hour will be between 0445 and 0515.

Plan: (See Sketch A).

(This article is not designed to present a tactical problem—therefore, the scheme of attack here presented is considered as a commander's decision, right or wrong.)

In very general terms, the plan provides for:

a. A formal preparation to be omitted, but guns to be laid ready to fire a 5-minute preparation when the enemy indicates he has discovered the attack.

b. H hour to be at 0445 (15 minutes prior to first light) L of D as indicated on Sketch A.

c. An effort to be made to build by stealth a tank crossing over Peek Creek at A, the work to be covered by a small protective force at B.

d. TD overhead direct fire support to be rendered from vicinity of P.

e. Initial attack: 1st Bn 6 Inf to take Obj. 1, (see Sketch B); 3d Bn 6 Inf (+1 tank company) to take Obj. 3.

f. Engineers to gap minefield at C.

g. 2d Bn 6 Inf to take Obj. 2 (passing through Obj. 1).

h. 13 Tank Bn (—), moving via Gap at C, to take Objs. 4 and 5, and vigorously assist in taking Objs. 6 and 7.

i. 1st Bn (from Obj. 1) to take Obj. 6 from the west.

j. 3d Bn to take Obj. 7 (passing through Obj. 6).

k. As each objective is taken, fire to be placed on subsequent objectives and closely coördinated with the effort of the troops designated to take those objectives.

l. 1st Bn 7 Inf to remain in reserve throughout.

This plan is not particularly complicated, but neither is it entirely simple—not so simple, for example, as a straight frontal attack on Objs. 5, 6 and 7 (the main position) simultaneously. The plan will permit tanks to be used to their utmost; it takes advantage of the protection offered by the nose DN (extending Southeast from Hill 638) against fire from Hill 662; it provides for taking Hills 638 and 662 from the flank. Without attempting to hold a brief for this plan, the tactical soundness of which is unimportant to the object of this article, it is desired to emphasize that simplicity, however desirable, must sometimes be sacrificed in an attack against a strong position, and further that the resultant more complicated plan demands a clear presentation in orders so that they can be thoroughly understood and executed by the troops.

To effect the "coördinated execution" of this plan, it is proposed to present the details of it in a "Phase Plan" as previously mentioned. The phase plan does *not* preclude the necessity for the Paragraph 3 of the Field Order, but it does take over much of its function. The Paragraph 3 must clearly state the prime mission of each unit, still a necessary provision. As a sample, this briefer form of Paragraph 3 is stated for one unit only, the 1st Bn 6 Inf:

"3. *a.* The 1st Bn 6 Inf will attack to seize Obj. 1, assist by fire the attack on Obj. 2, and will attack in conjunction with the 13th Tk Bn to seize Obj. 6, and assist by fire the attack on Obj. 7. (See Phase Plan)."

SEE NOTES BELOW.

Phase	*Time*	*Unit*	*Action*
1. a.	0400	27 FA	Pieces laid for preparation fires (Concentrations 27E, 27B, 32C, 37C, 21G, 35C, 33E, 33D, 33B)
b.	0400	68 FA	Pieces laid for preparation fires (Concentrations 22C, 22E, 22D, 28B, 28C, 24A, 31C, 31F, 31G)
c.	0400	Co C 136 Chem Mtr Bn	Pieces laid for preparation fires (Concentrations Omitted)
d. (1)	0400	Mortars 1st Bn 6 Inf	—do—
(2)	0400	Mortars 2d Bn 6 Inf	—do—
etc.	etc.	etc.	All preparatory fires made ready to be laid down on call
#2. a.	0330	1st Bn 6 Inf (Co F 6 Inf attchd)	Close in assembly area at K
# b.	0400	2d Bn 6 Inf (—Co F)	Close in assembly area at M
# c.	0400	3d Bn 6 Inf	Close in assembly area at L
# d.	0430	Co A 13 Tk Bn	Close in assembly area at L, attached on arrival to 3d Bn 6 Inf.
# e.	0330	Co C 16 Engr	Close in assembly area at L
# f.	0500	13 Tk Bn (—Co A) Co B 701 TD Bn attchd	Close in assembly area at (point 1000 yards south of L)
etc.	etc.	etc.	All elements are moved into respective assembly areas
3. a.	WO	27 FA	Execute preparatory fires (30 rounds on each of nine concentrations. Total elapsed time, 5 minutes)
b.	WO	68 FA	—do—
etc.	etc.	etc.	All fire elements are similarly instructed. (Note: The preparatory fires are on call by the CO of any of the attacking infantry battalions, subject to approval by the force commander.)
#4. a.	0330	1st Plat Co K, 3d Bn, 6 Inf	Occupy woods at B, and from that point cover work of engineers building crossing at A.
# b.	0330-0430	2d Plat Co C, 16 Eng	Complete tank crossing at A. (Post Markers).
#5. a.	Cross L of D at 0445	1st Bn 6 Inf	Attack to seize Obj. 1
# b.	Cross L of D at 0445	3d Bn 6 Inf (+ Co A 13 Tk Bn)	Attack to seize Obj. 3. Pick up Plat at B. Tanks cannot see to shoot prior to 0510.
# c.	Cross L of D at about 0500	Gapping parties Co C 16 Engr	Follow directly behind 3d Bn 6 Inf to C.
# d.	0515	2d Bn 6 Inf	Close in assembly area at K. Await attack orders. Co. C, 701 TD Bn, joins and is attached.
# e.	0515	Co C 701 TD Bn	Closes in assembly area at K. Attached to 2d Bn 6 Inf.
# f.	0530	1st Bn 7 Inf	Close in assembly area at M. Remain in Reserve in that locality.
#6. a.	0445	Co A, 701 TD Bn	Occupy previously selected positions at P.
b.	0515-UOL	—do—	Engage by fire targets of opportunity which may appear on forward slopes of Hills 638 and 662, beyond (north of) the line QDJ, *only* (See Note (8)).
7. a.	WO	27 FA	Fire counter mortar program (Conc. omitted)
b.	WO	68 FA	—do—
etc.	etc.	etc.	Similar instructions to all high angle fire units, including infantry battalion mortars. Mortar program based on known and suspected positions, and developed over period of last month. On call by CO of any attacking battalion, upon approval of Force Comdr.
#8. a.	0545 (Target Time)	1st Bn 6 Inf (+)	Occupy Obj. 1. Engage by fire targets on Obj. 2 and at points N, D, and J. Cover by fire engineer gapping parties at C.
# b.	0545 (TT)	3d Bn 6 Inf (+)	Occupy Obj. 3. Engage by fire targets on Obj. 4, 5 and 6, and at Point Q. Protect engineer gapping parties at C.
# c.	0545 (TT)	Gapping parties Co C 16 Engr	Gap minefield (minimum gap width 24 feet) at C. Estimated completion time 20 minutes after Target Time. Post markers. Notify CO 13 Tk Bn.
9. a.	WO	2d Bn 6 Inf (+)	Move via Obj. 1, attack to secure Obj. 2.
b.	WO	13th Tk Bn (—)	Move via route: west of Hill 537—A—gap at C, to seize Obj. 4 and Obj. 5, in that order.
c.	WO	3d Bn 6 Inf	Assist, with one company (Co K) the attack of the 13th Tk Bn on Obj. 4. Emplace the attached tank company (Co A) on Hill 529 to overwatch the attack of the balance of the 13th Tk Bn; on arrival in that overwatching position, Co A reverts to command of CO, 13th Tk Bn.
d. (1)	WO	Co C, 136 Chem Mortar Bn	Smoke line UJ, to block off Obj. 7. However, if wind should commence carrying smoke westerly, cease smoking operations immediately.
(2)	WO	Mortars, 1st Bn 6 Inf and 1st Bn 7 Inf	Fire concentrations—and—(assumed just north of Point N, actual locations omitted).
(3)	WO	68 FA	Fire concentration Block 22.
(4)	WO	27 FA	Fire Concentration Block 33.
(5)	WO	Co A 701 TD Bn	Watch particularly for, and engage any enemy tanks which may appear vicinity Obj. 6 or in gap at G.
			(Phase 9d is designed to protect R flank of 13th Bn as it makes the dangerous turn after passing through minefield at C).
#10. a.	0700 (TT)	2d Bn 6 Inf (+ Co C 701 TD)	Occupy Obj. 2. From that position: Protect R of force, and assist by fire the attacks on Obj. 6 and Obj. 7. (See Phases 11*a* and 13*c* below.)
# b.(1)	0700 (TT)	Elements 13th Tk Bn (—) (Assisted by Co K, 6 Inf)	Occupy Obj. 4 Operations against Objs. 4 and 5 are concurrent.
# (2)	0715 (TT)	—do—	Occupy Obj. 5.
11. a.	WO	1st Bn 6 Inf (+)	Move from Obj. 1, via route: S of Obj. 3—Point R, to attack Obj. 6.
b.	WO	13th Tk Bn (—)	Emplace one company to secure Obj. 5. With remainder of force, assist 1st Bn 6 Inf (+) in attack on Obj. 6. (Tanks should be able to climb western face.)
c.	WO	1st Bn 7 Inf	Move to reserve position vicinity Obj. 2.
12. a. (1)	WO	2d Bn 6 Inf (+)	Lift fire from Obj. 6. Continue fire Obj. 7.
(2)	WO	—do—	Lift fire from west half Obj. 7. Continue fire on east half.
(3)	WO	—do—	Lift all fire from Obj. 7.
b. (1)	WO	Co A 701 TD (at Point P)	Lift fire from Obj. 6. Continue fire on Obj. 7.
(2)	—do—	—do—	Lift fire from Obj. 7.
13. a.	0815 (TT)	1st Bn 6 Inf (+)	Occupy Obj. 6. Support by fire attack on Obj. 7.
b.	WO	13th Tk Bn (—)	Continue to occupy Obj. 5. Co A may be moved forward from Obj. 2. From Point G and Obj. 6, support, by fire, attack on Obj. 7.
# c.	WO	3d Bn 6 Inf	Move via Obj. 6 to attack Obj. 7 (Start of movement *may* be ordered prior to completion of Phase 13*a*.)

#14.	0915 (TT)	3d Bn 6 Inf	Occupy Obj. 7. Clean out woods at S.
15. a.	WO	One Company 13 Tk Bn	Move via route R—Q—D to flush (by fire) enemy from woods at J. If resistance continues, 2d Bn 6 Inf will (on order) assist, by occupation of woods.
b.	WO	2d Bn 6 Inf	(See above)
#16. a.	Without Orders	3d Bn 6 Inf	Organize Obj. 7 for defense against counterattack (See 16*d* (1) below).
# b.	Without Orders	1st Bn 6 Inf (+)	Organize Objs. 5 and 6 for defense against counterattack.
# c.	WO	13th Tk Bn	Assemble Bn in area GRQ in counterattack reserve and in preparation for missions of exploitation. Emplace one platoon in direct firing position at G and one at T, to engage targets of opportunity and to resist possible counterattack.
# d.(1)	WO	2d Bn 6 Inf	Send Co C 701 TD to Obj. 7, where it becomes attached to 3d Bn 6 Inf.
# (2)	WO	2d Bn 6 Inf	Force Reserve. Assemble vicinity Point N.
e.	WO	1st Bn 7 Inf	In vicinity Obj. 2, remain assembled and prepared for exploiting mission in conjunction with 13 Tk Bn.

NOTES:

(1) To spare reader unnecessary detail, the "Phase Plan" is not entirely complete.

(2) "WO" equals "When Ordered." "UOL" equals "Until Ordered Lifted."

(3) "TT" equals "Target Time," or estimated time of accomplishment. This is at best an educated guess, but it serves to inform all concerned of the commander's idea of the time necessary to accomplish each job.

(4) "#" equals "Report Necessary." A report of accomplishment of this phase is mandatory. Such a report need be no more than (for example), "Phase Six Able, Okay."

(5) Routes to assembly areas are omitted.

(6) To fit all available firepower properly into the whole scheme of fire, certain missions are prescribed even for such elements as the infantry battalion mortar platoons. These missions are confined however to the mortars' respective parts in the preparatory fires and the countermortar program, and the infantry battalion commander retains first call on his mortar fire.

(7) Time schedule may be changed as the action progresses. Favorable results may speed it. Note that Phase 11*a* may be ordered before Phase 10*b* (2) is completed.

(8) Tanks or TD elements rendering direct fire support from stationary positions do so best according to a prearranged schedule, engaging specific known, suspected, or probable enemy positions. Careful, previous reconnaissance is necessary, and ground horizontal photographs to identify each target selected will be especially valuable.

It will be noted that the phase plan specifies certain actions by parts of subordinate units; an example is Phase 4 Able, which specifically requires the 1st Plat, Co K, 6 Inf (which still remains under command of the Battalion Commander) to occupy the woods at B to cover the engineers. This and all the other details of the plan should have been discussed carefully with the subordinate commanders, the plan perhaps modified according to their ideas, and, where practicable, their willing approval of it obtained. Then, after conference and discussion, the final scheme is made official and specific by publication as a part of orders.

Rigidity certainly need not result from the use of such a plan. The entire scheme may be abandoned by a single radio order, and nothing shall have been lost. *Modification* should be expected as normal, but modification is exceptionally easy to effect, since the original scheme is firmly impressed on all concerned. The phase plan is a good framework on which to hang changes, and the orders are usually simple: "Delay execution of Phase 2 by one hour," for example; or perhaps the reserve might be ordered to execute a phase originally the responsibility of another unit.

As intimated above, the phase plan becomes an excellent convention and a low-order code. In the situation described, one of the leading infantry battalions may come under considerable fire after it crosses the Line of Departure: to obtain the entire preparatory fire program the Battalion Commander merely asks, "Request execution of all of Phase 3." A request for execution of Phase 7 should bring down the entire countermortar program—or such parts of it necessary to engage the general area where enemy mortars are thought to be firing. Request for Phase 9 Dog will cover by fire the right flank of the tanks making a flanking movement in the face of the enemy. The arrival of the 3d Bn 6 Inf in its assembly area is reported by "Phase 2 Charlie, Okay." "Execute Phase 6*b*" will launch all the action listed there under. And so forth.

The writing of the phase plan demands that the commander think completely through his battle, to include the organization of the objective against enemy counterattack. It sets down, in detail, the scheme of maneuver, so that all concerned may thoroughly understand the commander's object and methods, beyond possibility of doubt.

Although the various phases of the phase plan are numbered and listed in approximate chronological order, the chronology may vary, and some phases are actually concurrent with others. However that may be, the subordinate commander will gain a very accurate idea of the expected or intended sequence of events, and where, in that sequence, he fits, where flanking or following units fit, where direct and indirect supporting fire units fit.

Finally, it may be said that the phase plan works, in battle, and furthermore that it is not offensive to subordinate commanders who have had ample chance to study it previously and suggest change; rather, battalion commanders, in my experience, welcome specific responsibilities and appreciate definite fixing of tasks upon themselves and upon units to their right and left —units upon which depend so heavily their own success and well-being.

The Tank-Infantry Team In An Armored Division

by Major Edward Bautz, Infantry[*]

MUCH has been written about the Tank-Infantry team as it applies to infantry divisions but little has been said about the modern bases of the Armored Tank-Infantry team—the tank and armored infantry battalions of the Armored Division. Here we have team work at a high level; having lived, worked, traveled, trained, and played together, the officers and men of these battalions more readily understand each other's problems, capabilities, and limitations—which is the primary requisite of any successful team. The Armored Tank-Infantry team is a part of the larger team which embodies the artillery, cavalry, engineers, air corps, and all supporting services. Proper employment of this team provides for the violent attack which makes manifest the potential shock action which is organic in the Armored Division, and in which speed, maneuverability, and fire power are combined and utilized to the fullest.

The following discussion is based on experience with the 4th Armored Division throughout the campaigns in Europe. It is one way in which tanks and infantry may be employed and its results have indicated it to be a successful way.

Let us examine more closely the Armored Tank-Infantry team, remembering always that it is only a part of the larger team. The infantry battalion consists of three rifle companies, a headquarters company, and a service company. The tank battalion consists of three medium tank companies, one light tank company, a headquarters company, and a service company. In each case the service company includes a maintenance platoon, and the headquarters company a reconnaissance, mortar, and assault gun platoon. In addition, the headquarters company of the infantry battalion possesses a heavy machine-gun platoon. Each of these battalions is administratively complete and thus is extremely flexible for tactical employment.

There are two ways of combining these battalions to make Tank-Infantry teams. First, we may attach an infantry company to a tank battalion and a tank company to an infantry battalion. The advantage of this system is that the next higher headquarters (Combat Command) has two complete subordinate headquarters, with commander and staff properly organized, which may be assigned separate phases of coördinated operations, or independent tasks. In assigning any particular mission, the combat commander will select the "infantry-heavy" team or the "tank-heavy" team in accordance with the type of the task. For example, if there are rivers to be crossed, woods to be cleared out, or cities to be seized, it is evident that the "infantry-heavy" team should be assigned this mission; conversely, when it is expected that a large number of enemy tanks or other armored vehicles will be encountered, the "tank-heavy" team would receive the call. The battalion not assigned the principal rôle remains in close support, ready to grasp any opportunity or unforseen "break" arising, or to neutralize and nullify any surprise hostile action. The disadvantages of this system are that a nonorganic element must be combined with, or attached to, a battalion, and normal administrative channels are somewhat disturbed. It places added administrative burdens on the attached company commander which would normally be absorbed by the battalion staff of his own battalion. From the battalion viewpoint, additional administrative arrangements must be made. For example, the armored infantry battalion does not have sufficient heavy wrecking equipment to evacuate knocked out tanks, and the tank battalion trains do not normally carry all types of ammunition required by an armored infantry company. To overcome this, small service elements of one battalion must be attached to the other battalion, which simply means the addition of another nonorganic element. In addition, enemy action, terrain, and the general enemy situation often do not permit the assignment of missions in accordance with the composition of the team and according to academic principles. Therefore, the "tank-heavy" team may find itself with a powerful force, but lacking sufficient infantry to execute effectively and efficiently the assigned mission, or any particular phase of that mission. The inverse is obviously true of the "infantry-heavy" team.

There is a second way of making an Armored Tank-Infantry team whereby the medium tank companies and the armored rifle companies are teamed together and in which both battalions operate in an integrated fashion. It may be said that this leaves the light tank company without infantry support but, if the situation warrants, a platoon may be attached to the light tank company from the armored infantry company least apt to be employed. It should be noted here that light tanks have a different mission than medium tanks and that infantry support, although desirable, is not as necessary in the accomplishment of their mission. The armored infantry ride with the tanks in their carriers, or on the tanks, and know tanks well enough to know how to protect them. Generally speaking, the infantry mission is to protect the tanks against close-in enemy attack with antitank rockets, grenades, explosive charges, etc. On the march, this may be accomplished by the infantry riding on tanks or in carriers and keeping careful watch to the immediate flanks; i.e. checking roadside ditches, clumps of bushes or woods, and windows in buildings. All doubtful areas are explored by fire by both infantry and tanks as they pass by. When it becomes necessary for the infantry to dismount and fight on foot, such as in town fighting, the same general system applies. In either case, aggressive infantry action, whether by fire alone or by fire and movement, is the best method of protecting the tank. It must also be remembered that the only place tanks cannot go is where it is physically impossible for them to go. There is no such thing as "tanks can't fight at night" or "tanks can't fight in towns" or "when the situation is uncertain, lead with infantry." Tanks and infantry move together wherever it is physically possible for the tanks to go. No definite formation is prescribed, for it varies with the terrain, enemy dispositions, and as the immediate mission changes. Supreme confidence in each other is the keynote to success, and this is soon realized in battle with tanks and infantry that have had the opportunity to train and live together. The tanks must take the initiative by virtue of the maneuverability and superior communications. Company commanders of infantry companies ride with company commanders of tank companies, infantry platoon commanders ride with tank platoon commanders, both battalion commanders stay close to each other, and their command posts are also together. With little transitional training, subordinate commanders of both battalions readily accept and understand orders issued by either battalion commander or members of either staff. With this type of team the combat commander must take a personal hand and will normally ride with or be near the two battalion commanders. In his absence, a battalion commander must definitely be designated as commander of the entire force. In actual practice with well-trained units, it is not necessary to designate an infantry company commander or a tank company commander as team commander in so many words. By experience and coöperation, and without formal order, an infantry commander takes over for an infantry mission and a tank commander for a tank mission, and in either case help each other in every possible way. This, however, is the goal to strive for, and in training or in initial action with strange troops teamed, it may be necessary to go by the rule: "The supported unit commander is in command." Thus, as the mission changes from a tank mission to an infantry mission, the commander is also changed. Except for particular instances (such as independent missions), staff officers must not be used to command the individual Armored Tank-Infantry company teams. If this is done, the whole operation of the staff is disrupted. Staff officers must be used freely to issue orders, inspect the progress being made, coördinate use of artillery, engineers, air, etc., and assist in making plans for future operations. This does not preclude a staff officer traveling with a team or moving along with any phase of an attack. In fact, this is desirable, since he takes over the duties of coördination and liaison with other units and supporting elements and thus permits the company commander to devote all his energies to the direction of his company. At the same time he is in a position to completely comprehend the situation and advise his commander. Properly employed, there are no excess staff members. Coöperation between units is directly dependent upon coöperation between individuals. When the commanders manifest the spirit of coöperation, then, and then only, can this system be successfully employed.

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There are two distinct types of offensive operations in which the Armored Division is employed, commonly termed the "Rat Race" and the "Slugging Match." The former is characterized by rapid advances against spotty resistance of up to 100 miles a day, where the objectives are more or less strategic in nature—key terrain, bridges, road centers, railroad centers, sealing off a pocket, etc. In more technical language, it embodies the exploitation and pursuit. In contrast, the "Slugging Match" is characterized by advances counted in thousands of yards or a few miles a day against constant and usually strong resistance. Here the objectives are limited, consisting mainly of terrain dominating the immediate field of battle. This may be called the straight attack and may develop into an exploitation. In either case, a combination of tanks and infantry is more desirable than either one alone.

We have said that the "Rat Race" is characterized by rapid movement. The armored infantry may be mounted in their carriers or on tanks. In the latter case the carriers may be filled with ammunition, rations, fuel, and other supplies. Assuming that the Armored Tank-Infantry team is made up by matching company by company, let us see what further dispositions might be made. The light tank company with the assault gun platoons of both battalions attached, and perhaps one platoon of armored infantry, can lead or operate on an exposed flank. If the combat command is advancing along one road, between individual teams tactically spaced would be interspersed artillery, engineers, cavalry, trains, and other attachments allotted to the column.

Proper spacing and combination provides for elements near the front to crash through moderate resistance, to remove obstacles, or to provide a base of fire for other elements deeper in the column to maneuver. The actual order of march is a vital command decision but will not be touched upon here since discussion would require the building of a situation and appraisal of the entire combat command rather than merely of the Armored Tank-Infantry team about which we are concerned. The following might be considered as a typical order of march for a combat command:

Light Tank Co. + Aslt. Gun Plats. Tank and Armd. Inf. Bn.

Command Group Tank and Armd. Inf. Bn. (*combat commander).

Medium Tank Co. and Armd. Inf. Co.
One Plat. Armd. Eng. + Bridge Truck.
Medium Tank Co. and Armd. Inf. Co.
Armd. F. A. Bn. (105mm SP).
Armd. Eng. Co. (—one Plat.).
Hqs. Co. Combat Command.
Hqs. Co. Div. Arty.
Armd. F. A. Bn. (105mm SP).
Hqs. Cos. Tank and Armd. Inf. Bn.
Medium Tank Co. and Armd. Inf. Co.
F. A. Bn. (155mm How.—towed).
Trains + (Btry. Antiaircraft).
Armd. Med. Co.
Armd. Ord. Co.
Mech. Cav. Troop + T. D. Co. on flank.

If the force is moving in more than one column, the light tanks may be used on one flank, and individual teams may be used to cover the other flank or take particular objectives off the main route. It is preferable that the main column move on the best road so that the trains may have the least difficulty in keeping up. Advancing in multiple columns makes possible a bigger sweep of area as well as shortening the time interval necessary for columns to close. The individual team of a tank company and armored infantry company combined is powerful enough to make a large attack and it is unhampered by trains and other administrative vehicles. For example, when attempting to seize a crossing over a river the chances of securing a bridge are greater if the force is divided, and three columns strike simultaneously for three bridges. If one of the small columns does become engaged with a force too large for it to handle it can easily be moved around the position, or their steps can be retraced and resistance by-passed at some distant point. It is also possible for these columns to use poor roads or to travel cross country for relatively long distances, and by doing so increase the chance of surprise. In this type of operation the entire force bivouacs in close formation and all-round security is provided. This is easily done with balanced Armored Tank-Infantry teams. The infantry can easily outpost the tanks and may assist the tanks in refueling, resupplying, and maintenance. At the same time, the tanks are in position where they may employ all of their weapons to support the infantry in case of an attack. Assault guns, mortars, and other similar organic means are emplaced, registered, and data computed for defensive fire. All elements of attached arms are coördinated to provide security from attack for 360 degrees. In this type of operation, all-round security is most important, for it is not unusual to be cut off from the rear. It was also found that command could be more easily exercised in this type of operation from a peep (¼ ton C&R) than from a tank. Difficulty was first experienced in communications, but by modifying the electrical system of the peep from six to 12 volts and replacing the SCR-510 by the SCR-508 this difficulty was eliminated.

Now let us consider what we have called the "Slugging Match." It was in this type of operation that the system of matching up tank and infantry companies was first employed. It has been previously stated that this type of operation was characterized by seizing one dominant terrain feature after another until the final objective was taken, or the limit of the day's operation was reached. In this case, the light tanks were normally used to follow up and protect the flanks that were opened by the advance of the medium companies. The armored infantry may ride in their carriers or on the tanks; the terrain and trafficability normally dictating the best solution, since the present carrier does not have the maneuverability of the tank. As in every operation, all plans are carefully laid in advance, including necessary artillery preparations and contemplated air strikes. The attack is then launched by each of these complete teams which move out one after the other and seize successively the dominant terrain features. This is a process of leapfrogging; when the first team reaches its objective it is in position to support the second team as it moves on to its objective. With three equally balanced teams, this process can be kept up almost indefinitely. At the same time, there is usually one team that is not engaged at any given moment; this team is then available as a reserve to reinforce one of the other teams or to take care of any unforeseen developments such as an enemy counterattack or a wide flanking movement. Coincidentally this team will have the opportunity for rest, maintenance, and resupply. The infantry again supports the tanks in the manner described before. A squad or half squad may be assigned to support each tank, or the bulk of the infantry may be shifted to support only a few tanks at any given time. The commanders again ride with each other and orders are issued over the tank radio. During these operations the mortar and assault gun platoons may be combined to supplement the support provided by the artillery. Frequently, however, the assault guns are employed well forward and deliver direct fire. It was found that these weapons could fire smoke missions very effectively and concentrations could be placed in small areas that the artillery was not reaching. The command post of these battalions is moved by bounds and is operated from stationary positions most of the time. By so doing the command post may be kept defiladed and usually within about 1,000 yards of the battle troops. This facilitates its functioning and there is little to fear from enemy action. Normally the executive officer and the S-1 operate the command post, handling all orders from higher headquarters, relaying information back to higher headquarters, handling all administration, resupply, and maintenance.

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*Combat commander with such personnel as he may desire travels well forward in the column but frequently moves about.

The battalion commander with the S-2 and S-3 actually conducts the battle, while the S-4 circulates among the companies, command post, and higher echelon supply agencies. It is usual for company maintenance sections, less recovery vehicles, and all "thin-skinned" vehicles to remain with the battalion command post. Bivouac security is performed in the same manner as in the formation before described, with the exception that it is necessary to pay less attention to the rear since relatively short advances cross country permit a link-up or tie-in between flank units. This presents to the enemy a continuous line which runs the entire length of the front.

We have had a glimpse of the Armored Tank-Infantry team; we may consider it a model in teamwork. It is perhaps felt that little has been said about Tank-Infantry coöperation. Long periods of training together and living together provide the necessary spirit of cooperation which wins battles. Both tanks and infantry must be trained to attack. This makes for aggressiveness and develops an offensive state of mind that is ready and anxious to plan and execute; the spirit of cooperation comes spontaneously, and with this spirit manifest no missions will seem too difficult. This spirit is perhaps best embodied by the words of a sergeant tank commander who was overheard to say, "They've got us surrounded again—the poor so and so's." Success in the Armored Division depends primarily on a frame of mind which dictates attack at all times. Through such an attitude, the shock action, fire power, maneuverability, and speed of the armored Division is employed to its fullest.

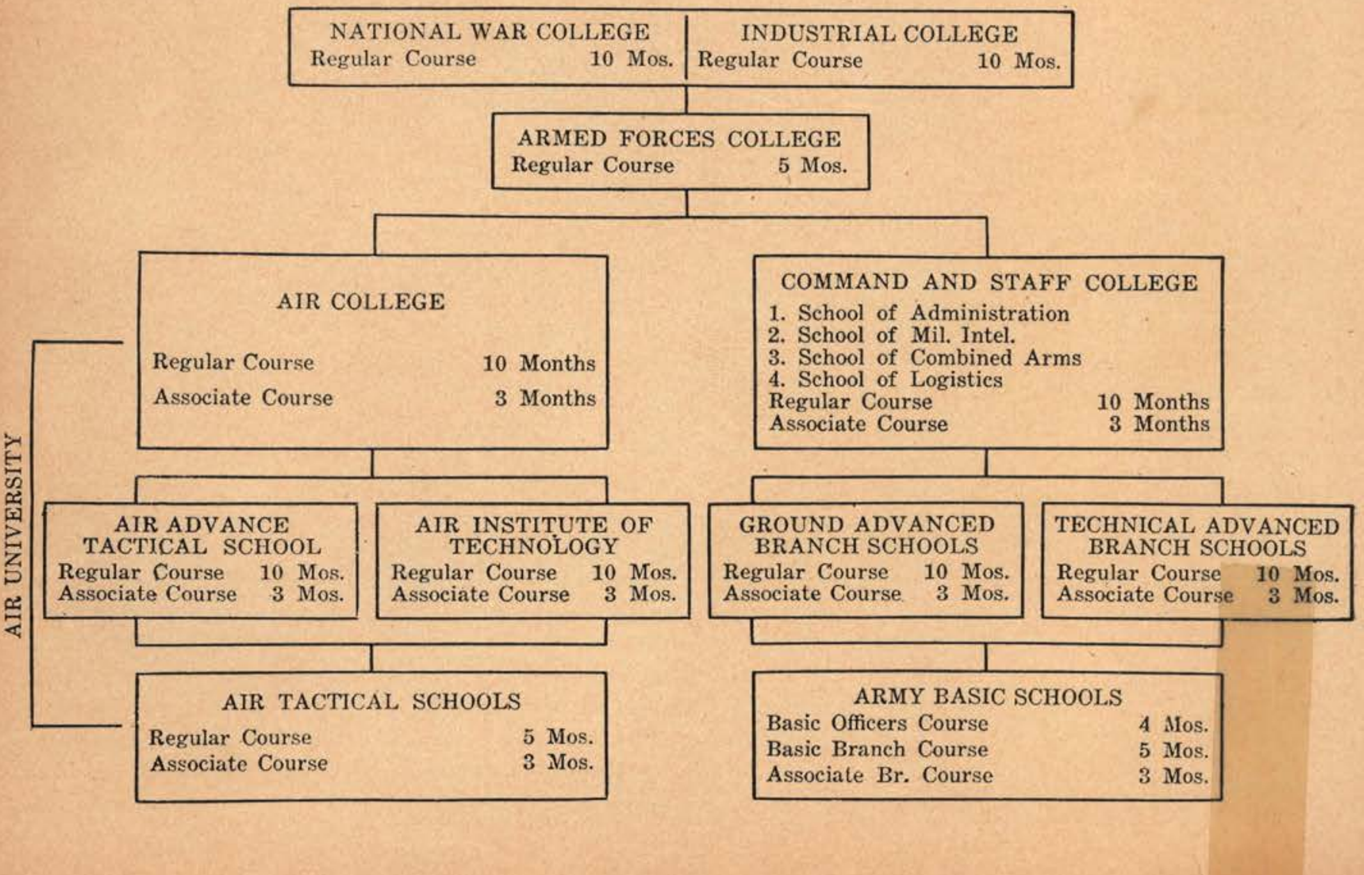
* * *

NEW SCHOOL PLAN FOR OFFICERS

A REORGANIZATION of the Army officers' educational system has been approved to provide for the progressive military education of an officer from the time he receives his commission until he completes a course at a high-level school conducted on a joint Army-Navy-and-Air basis.

The system would provide training during the first 20 years of an officer's active duty, the formal schooling integrated with periods of practical experience in the field.

First for all officers except those in Air Forces would come a four-month course in subjects common to the Army as a whole followed immediately by a five-month basic branch course for indoctrination in subjects of his branch. Other higher-level courses would follow. —*Army Times.*


NATIONAL WAR COLLEGE
Regular Course 10 Mos.
INDUSTRIAL COLLEGE
Regular Course 10 Mos.
ARMED FORCES COLLEGE
Regular Course 5 Mos.
AIR COLLEGE
Regular Course 10 Months
Associate Course 3 Months
COMMAND AND STAFF COLLEGE
1. School of Administration
2. School of Mil. Intel.
3. School of Combined Arms
4. School of Logistics
Regular Course 10 Months
Associate Course 3 Months
AIR UNIVERSITY
AIR ADVANCE TACTICAL SCHOOL
Regular Course 10 Mos.
Associate Course 3 Mos.
AIR INSTITUTE OF TECHNOLOGY
Regular Course 10 Mos.
Associate Course 3 Mos.
GROUND ADVANCED BRANCH SCHOOLS
Regular Course 10 Mos.
Associate Course 3 Mos.
TECHNICAL ADVANCED BRANCH SCHOOLS
Regular Course 10 Mos.
Associate Course 3 Mos.
AIR TACTICAL SCHOOLS
Regular Course 5 Mos.
Associate Course 3 Mos.
ARMY BASIC SCHOOLS
Basic Officers Course 4 Mos.
Basic Branch Course 5 Mos.
Associate Br. Course 3 Mos.

TANK COMBAT FIRING

by Brigadier General Bruce C. Clarke[*]

The training methods outlined herein were developed in the 4th Armored Division and successfully used by Brigadier General (then Colonel) Bruce C. Clarke in that division and later in the 7th Armored Division, to obtain perfection in crew training.

EXCELLENT results were secured by the use of simple methods of developing and testing crew technique. Too much emphasis cannot be placed on the observation of test runs by crews who are waiting for, or have completed, their tests; the officer critique after each run; and the encouragement among all participating personnel of free discussion and constructive comments which frequently lead to the development of desirable and efficient crew procedures that may be standardized within the unit. The training doctrine expressed herein is concurred in by The Armored School. Crew training is a basic subject to which too little attention has been given in the past.

Aside from a few special situations, tanks on an offensive mission engage the enemy by closing with him during an advance. In such an operation the tank comes under observation and fire of an enemy tank or antitank weapon, or comes unexpectedly upon other enemy forces. In either case, the tank is usually moving when it sights a target. The success of its mission, and in most cases the safety of the tank and crew, depend upon the ability of the crew to take the enemy target under fire effectively within a few seconds; in short, to "shoot from the hip and hit." Such shooting is not done at long ranges—100 to 600 yards is the rule. The tank fires to hit on its first shot. It must out-shoot the enemy to live.

Each member of the crew must be trained to proficiency in his particular job in order that the crew may be able to take a surprise target under fire quickly and effectively. In addition, the crew must be trained as a team in order that all of the several actions required of the members can be performed quickly in proper sequence, so that the first shot is fired promptly and sensed properly and subsequent shots, if necessary, follow the first in rapid succession, with proper and immediate corrections applied.

Until the tank crews of a unit are trained to such a standard they will not have the confidence necessary to cause them to attack with the abandon and violence which characterizes the most effective tank action.

Individuals of a tank crew are trained to the proficiency set forth by FM 17-12 (Tank Gunnery) FM 17-67 (Crew Drill Med. Tank), and FM 17-68 (Crew Drill Light Tank). FMs 17-74 and 17-75 cover the M26 and M24 tank respectively. The status of the crew's training should be checked continually.

The next step is the preliminary crew training. This training consists initially of the tank commander working alone with each of the other members of the crew in turn, to perfect the commander-driver, commander-gunner, etc. relationships. This training is followed by dry-run practice with the whole crew until they are working together smoothly.

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[*] Deputy Assistant Chief of Staff, Plans Section, AGF.

The commander-driver training can be carried out by maneuvering the tank in an area, with the tank commander giving commands in the prescribed manner until a mutual understanding between him and the driver is developed, and the expected reaction of the driver to the commander's orders is obtained.

The tank commander and gunner required the maximum training in working together. This can be accomplished by placing the tank in a stationary position where it has observation over varied terrain and having the commander select targets, issue orders, and work with his gunner until there is a smooth and rapid response to the proper fire orders.

The relationship between commander-driver and "bog" should not be neglected. Time spent in making sure that the loader functions without wasting precious seconds pays dividends.

When the proficiencies indicated above have been obtained, the whole crew can practice together and be checked by having an officer ride the back of the tank as it moves along a prescribed route. At intervals along this course the officer designates targets of various kinds and checks the orders of the tank commander and the execution of them by the members of the crew. More than one course is desirable. Later in the training, the time element should be introduced competitively between crews. The time is taken from the moment the commander acknowledges the target designated to the moment when the gun is layed. The laying is then checked.

The next step is combat firing. The ideal area for such firing is one in which the gun can be fired in any direction. Such areas are not usually available. The results can be suitably approximated in an area where one is permitted to fire in a small sector only. In such a setup, an area of about 500 by 1,000 yards is required, the longer axis parallel to the line of fire. The nearest 600 yards of the area is used as a maneuver area, the farthest 400 yards as the target area. Targets may consist of almost anything: old vehicles, car bodies, or silhouettes. A valuable addition to the course is a moving target towed on each end by a tank.

The firing and testing is done as follows: The tank crew mounts, does the necessary checking (see FM 17-67 and FM 17-68), and when ready, the conducting officer mounts and has the tank move on a meandering course in the maneuver area. During the movement along the course, the conducting officer points out targets one at a time to the tank commander who takes them under fires. The conducting officer notes the time necessary to get off the first shot, and subsequent shots, if they are fired. He also notes the fire orders, sensings, actions of driver, gunner, loader and "bog," and records the results on the suggested form, shown herewith. During progress over the course, he selects and designates targets which will require the use of all the weapons and in several directions relative to the path of the tank. The tank commander is told to order the proper ammunition, even though only HE may be actually used in the cannon for safety reasons. He also is told to fire only a limited number of rounds at a target, even thought he does not get a hit.

After the crew returns to the starting point it is critiqued by the conducting officer before all other available crews. With several tanks and several conducting officers, maximum use can be made of the range. About six targets on a run is sufficient. More than one run is desirable for each crew. Its improvement during subsequent runs will be readily noted. It is easy to grade the crews relatively and to foster considerable competition within a platoon or company. The crews take great interest in this type of firing.

Safety Officer. The conducting officer is also safety officer. He designates targets which have such a relative position to the tank that the firing will take place within the allowable firing limits.

Firing by Tank Destroyers. While this type of firing is probably less applicable to tank destroyer crews, they will receive considerable benefit from the same course of instruction and firing.

RECORD OF TANK CREW COMBAT FIRING

Place__________ Date__________ 194 .

Tank Comdr__________, Gunner__________.

Driver__________, Loader__________.

Bow Gunner__________

TARGET RECORD

Target Order	Type Target (Trk, Tk Doughs etc.)	Range	Direction (Front, Rt, Left Rr, etc.)	Time to fire 1st shot or burst	Sensing	Time to fire 2d shot	Remarks as to hits, etc.
1							
2							
3							
4							
5							
6							
7							
8							

Comments

a. Tank Comdr's Commands:__________

b. Actions of Driver:__________

c. Actions of Gunner:__________

d. Actions of Loader and Bow Gunner:__________

e. General Comment on Crew:__________

f. Any Malfunctioning of Tank:__________

____
Conducting Officer

Critique will be conducted before remainder of company on return to Starting Point.

Cavalry in World War II

by Major Hal D. Steward*

A TOTAL of 91,948 men served with the Cavalry during World War II.

This number was reached when cavalry was at its maximum strength on May 31, 1945. Further statistics on the numbers of officers and enlisted men who served both in the continental U. S. and overseas are given in the table below.

A total of 73 nondivisional cavalry units were in active service between December 7, 1941 and May 30, 1946, compared with only 20 such units still in active service on March 30, 1946. These 20 units were comprised of eight Mechanized Cavalry Groups, 11 Mechanized Cavalry Reconnaissance Squadrons, and the U. S. Military Academy Cavalry Squadron at West Point.

STRENGTH OF THE CAVALRY ARM

May 31, 1945 (Peak Strength)	Officers	Enlisted Men	Total
In Continental United States	2,845	19,298	22,143
Overseas	6,087	63,718	69,805
Total Os or EM	8,932	83,016	
GRAND TOTAL			91,948
March 1, 1946	**Officers**	**Enlisted Men**	**Total**
In United States	3,989	9,065	13,054
Overseas	1,967	17,646	19,613
Total Os or EM	5,956	26,711	
GRAND TOTAL			32,667

Of the original 73 nondivisional units, 13 Mechanized Cavalry Groups and one unattached Cavalry Reconnaissance Squadron fought in the European Theater of Operations. (A mechanized cavalry group was composed of group headquarters and headquarters troop and two attached mechanized cavalry reconnaissance squadrons.)

Groups were assigned to armies, and habitually attached to corps. Most of these attachments were permanent. Corps frequently attached these units, for operations only, to divisions—usually Infantry Divisions.

The 13 Mechanized Cavalry Reconnaissance Squadrons fought in the ETO as organic units of Armored Divisions (light), and two Armored Reconnaissance Battalions as organic units of Armored Divisions (heavy).

Forty-two Cavalry Reconnaissance Troops fought in the ETO as organic units of Infantry Divisions.

The only Cavalry Division to fight in World War II as a complete unit was the 1st Cavalry Division, which fought in three major campaigns in the Southwest Pacific, and now is occupying Tokyo.

During the fighting in Europe, mechanized Cavalry units were usually assigned one of the five following types of missions: (1) Offensive combat, including attack as well as pursuit and exploitation. (2) Defensive combat, including defense, delaying action and holding of key terrain until arrival of main forces. (3) Reconnaissance. (4) Security for other arms, including blocking, moving and stationary screening, protecting flanks, maintaining contact between larger units and filling gaps. (5) Special operations, including acting as mobile reserve, providing for security and control of rear areas, and operating as an army information service. The accomplishment of reconnaissance missions normally involved offensive combat as frequently as did the accomplishment of security missions.

Types of missions assigned to mechanized cavalry groups, based on 12 such units in combat were: defensive combat, 33%; special operations, 29%; security, 25%; offensive combat, 10%; and reconnaissance, 3%. Percentages are approximate.

From surveys, the following striking points were revealed: (a) The performance of pure reconnaissance missions by mechanized cavalry groups was rare; (b) the performance of defensive missions by mechanized cavalry groups was common; (c) the ratio of days of primarily mounted employment was about 1.8 to 1; and (d) for performance of offensive, defensive and security missions, it was normal for the mechanized cavalry groups to be reinforced by a battalion of field artillery, a battalion of tank destroyers and a company of combat engineers.

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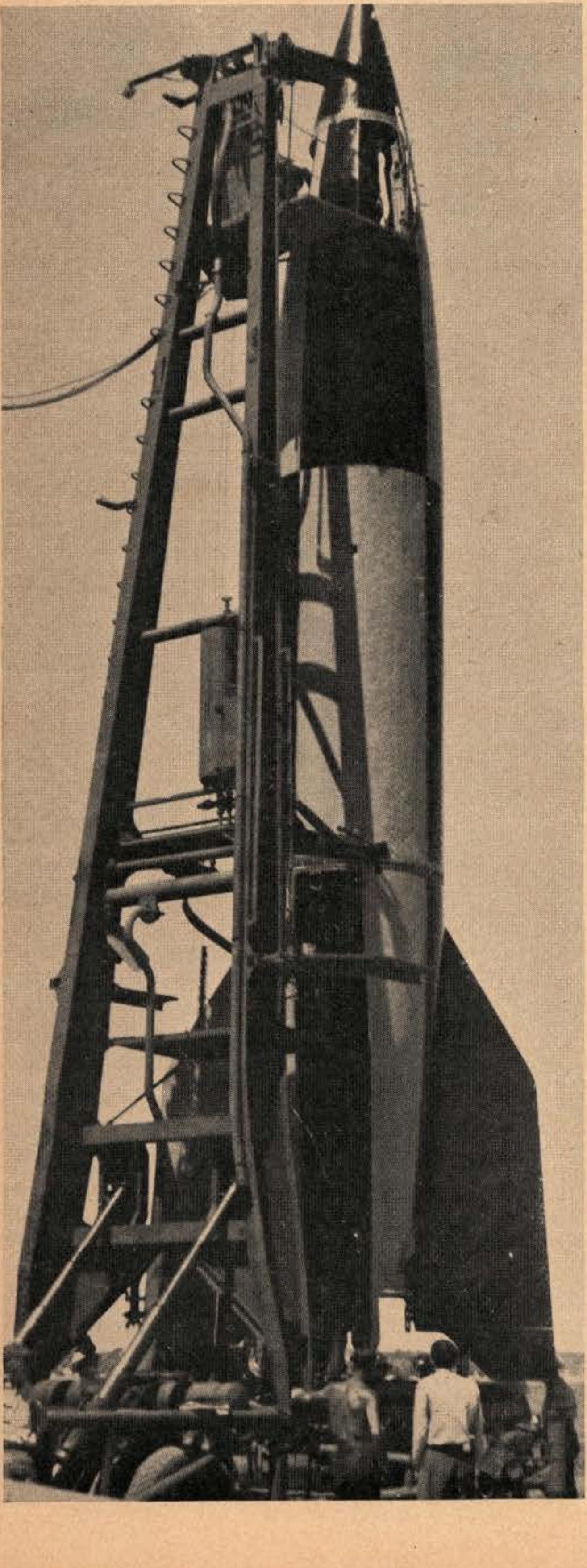
*Press Branch, War Department Bureau of Public Relations.

V-2---THE “ATOM



5,000-Mile Range Is Goal

A SELF-PROPELLED Atomic Bomb with a 5,000-mile range is the goal of the Army Ordnance Department. Daily at the White Sands Ordnance Proving Grounds in New Mexico, Ordnance experts are working toward the development of such a bomb, which will in all probability prove to be the most potent war weapon in the world.

The Ordnance Department is getting its start on the weapon from captured German V-2 bombs, which at present are self-propelled and have a maximum range of about 200 miles at a velocity of 2,620 feet per second, which is about the speed of a .30 caliber rifle bullet.

By research and development, the Ordnancemen hope to increase the range of this bomb to the previously mentioned 5,000 miles, and load its warhead with atomic explosives. Further hopes of Ordnance experts are that the bomb can be propelled by atomic energy instead of its present fuels of alcohol and liquid oxygen.

When Navy men heard about this potential weapon, one Naval officer remarked, “If this proposed weapon is developed to expectations, the Navy will have to pick up its marbles and go home.”

First American Firing of V-2

On April 16, 1946, at White Sands, New Mexico, the first American firing of the German V-2 bomb took place. The firing was reasonably successful despite the fact that one of the bomb’s fins fell off a few seconds after it had bolted into the air. The test established the fact that American Army Ordnance personnel are capable of firing the monstrous bomb.

The V-2, which was used by the Germans in the latter stages of the European war, is 46.05 feet long, and weighs 28,380 pounds when fully fueled and loaded. Unloaded it weighs 8,816 pounds. The bomb’s diameter is 5 feet, 4.9 inches. In its present stage, the V-2 fully loaded with its 2,200-pound warhead will make a crater in the earth about 35 feet in diameter and 18 feet deep. It can be fired vertically and is capable of reaching an altitude of approximately 100 miles.

A crew of about 28 men is needed to set up and fire the V-2. Two men are required for the firing board; five men on propulsion; seven on the trailer on which the bomb is carried; four on the electrical port; and 10 men to fuel the bomb.

Ninety minutes is required to put the bomb into position and fire it. This also includes prefire testing. For safety, personnel must be at least 100 yards from the bomb when it is fired, but a greater distance is preferable.

In its present stage, the V-2 roughly compares in

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CARDE

C AGE" WEAPON

by Major Hal D. Steward*

damage-power with the American 4,000-pound aerial bomb. The weight of the actual explosive in the warhead is 2,200 pounds. The explosive used is Amotol, the same as employed by the American Army.

V-2 is accurate to within 200 yards of a designated target. Its cost is approximately $20,000.

RANGE ALMOST UNLIMITED

The disadvantage of the bomb at present is its great weight, which is caused by the large amount of fuel it must hold. Until a substitute fuel can be found to propel the bomb, it will be almost impossible to increase its range. Should it be possible to use atomic energy for propulsion as it is hoped, the bomb will have an almost unlimited range.

If it can be propelled by atomic energy, and carries an atomic warhead, the use of aircraft in war would be practically outmoded. It then would be possible to send thousands of these bombs by radio control over a designated target, and maintain an even greater accuracy than is now possible from aircraft.

With such a bomb the only mission ground troops would have is that of occupation.

The United States is not the only country endeavoring to develop this bomb. Most major world powers now are employed in research and development on this "Atomic Age" weapon that has every possibility of becoming the most dangerous war weapon the world has ever seen.

Experiments on the V-2 are being conducted in the middle of the New Mexico desert, 85 miles by road west of El Paso, Texas. The area is level and the small garrison camp can be seen from a distance of 10 miles before it is finally reached. The camp is commanded by Lieutenant Colonel Harold R. Turner, an Ordnance officer with years of engineering experience.

The spot at which the V-2 is actually fired is nearly 10 miles from Colonel Turner's camp. It is known as "The Technical Area," and is encircled by a barbed-wire fence which has armed guards at each entrance. Entrance can be obtained only with a pass signed personally by Colonel Turner.

V-2 FIRING CONTROL

Inside the technical area, besides the base from which the V-2 is fired, is a cement blockhouse with walls of cement 10 feet thick, and a ceiling which is 27 feet thick. Inside this concrete house are the electrical instruments that fire the V-2 and control its flight.

Once the bomb is fired its flight is followed by radar units which have been set up at many places on the New Mexico desert. Every effort is made not to lose track of the bomb for one moment while it is in flight. During the first firing test it was possible for the Ordnance technicians to follow the bomb from the time it was fired until it plunged into the ground several seconds later and exploded.

Major Herbert L. Karsch of 2409 South St. Louis Street, Tulsa, Oklahoma, a petroleum engineer in civilian life, has direct charge of the firing of the V-2 bomb. He probably knows more about the V-2 bomb than any other officer in the American Army.

The V-2 is carried and put into firing position by a Mono-wagon, a trailer invented by the Germans which has hydraulic levers that lifts the V-2 into a vertical position.

When a firing of the V-2 is scheduled, Ordnancemen in jeeps warn all the near-by ranchers.

During the next few months several V-2s are to be set off in the New Mexico desert in experiments that may develop the V-2 into the world's most powerful weapon.

And what will be the defense against this weapon? That is anybody's guess. When the author asked one high-ranking antiaircraft officer what would be used as a defense against this potential atomic weapon, his answer was: "That's a good question."

Picture shows Field Marshal Montgomery, bending, with other British officers examining the remains of the jet unit of a V-2 which landed in a field in Belgium. The bomb travels 30 to 60 miles above the earth.

British Official Photo

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*Press Branch, War Department Bureau of Public Relations.

Horses Were Used

by Captain Raymond F. Baker

The place–San Stefano.
The date–August 19, 1943.
The event–the formation of a horse reconnaissance troop.

HARDLY had the Sicilian Campaign ended victoriously on August 18, 1943 before Lieutenant General (then Major General) Lucian K. Truscott, Jr., commanding general, Third Infantry Division, directed that all animals which had been gathered by various units of the division for pack transportation during mountainous operations be assembled at San Stefano, Sicily. Mules and horses totalling 120 were collected and three officers and 16 enlisted men were assigned to care for them.

General Truscott issued orders on August 19 creating a mounted reconnaissance troop. An improvised table of organization based upon WD T/O&E 2-17 was used, based on anticipated operations, and equipment that was available. A troop of five officers and 175 enlisted men was authorized. In addition, a mule pack train was to be formed in four platoons of 50 mules each, one officer and five enlisted men per platoon, or a total of four officers and 20 men.

The Third Division was ordered to Trapani for reorganization and training a day later. The mounted elements were assigned an area covering about 10 acres, on which were olive groves and a salt flat that made the location ideal for animal "housekeeping."

Volunteers were called for to form the unit–and one horse-trained cavalryman was found in the entire division. The remainder of the men recruited were from the cowboys, ranchers, city youths and farmers of the infantry, artillery and engineers. Officers were drawn from division units as they could be spared.

Animals were collected from the Italian cavalry stables in Palermo, from farmers and natives who had seized animals abandoned by retreating German and Italian forces, by requisition, and through Allied Military Government facilities. Equipment was gathered from warehouses in Messina, Palermo and Trapani. The only American equipment initially used was 75 Phillips cargo packs, which were flown in from storage in Africa for use by the pack train.

The reconnaissance troop was organized into three reconnaissance platoons and a weapons platoon. Troopers were given their choice of individual weapon–carbine, '03 rifle, or BAR. We finally settled on '03 rifles and four BAR's to a reconnaissance platoon. The weapons platoon carried six light machine guns, two .50 caliber machine guns, and two 60mm mortars. Only one radio was employed–a SCR 284 pack set, hand generated–for communicating with the division headquarters. With the troop, hand and voice signals were used.

(Captain R. W. Baker is an instructor in the Tactics Department of The Cavalry School, Fort Riley, Kansas. He was an enlisted man in the 3d Cavalry Regiment at Ft. Meyer, Va., from 1926 to 1938 and served in Troop F while Lieutenant General (then Captain) Lucian K. Truscott commanded Troop E. Captain Baker was with the 102d Infantry Regiment in Algiers in 1943 when General Truscott called for him to form the mounted elements of the 3d Infantry Division in Sicily. He served through the Italian campaign and later commanded the 3d Division reconnaissance troop in France and German. His article is the first account of the mounted troop's action which has become available from a member of the unit.—**Editor's Note.)**

Training was hurried. First priority was given to conditioning the men and animals, and teaching the new horsemen the rudiments of equitation and care of their mounts. Cavalry combat tactics were practiced whenever possible. Hasty firing courses were erected along various mountainous routes used in conditioning the men and animals. The troop practiced patrolling the roads and mountain passes. On approaching the target area, platoon and troop attacks were executed. Stream fording, map and compass reading and cross-country movements were practiced constantly. All training was conducted with full field equipment and combat loads. Often the troop remained away from its base one or two days. By the third week, it was possible to select noncommissioned officers.

The packers, formally called the 3d Provisional Pack Train, were organized into four platoons and were attached to the troop. Personnel learned to pack and adjust loads, and quickly picked up a broad knowledge of the characteristics of mules and their care.

After a month's arduous training in 12- to 16-hour days, the new animal units were tough, and hard. They could move long distances and arrive fit to fight.

The troop, known as the 3d Provisional Reconnaissance Troop, Mounted, to distinguish it from the mechanized reconnaissance troop, was composed of five officers, 126 enlisted men, and 143 horses on September 16. The pack train consisted of four officers, 25 men, and 349 mules. It was decided that until the reconnaissance troop obtained its 50 additional men, the pack train would, in addition to operating the supply train, transport the reconnaissance weapons and equipment so that the riflemen could be at maximum fighting strength.

The organizations loaded into two LSTs at Palermo, Sicily, on September 18, just one month after the activation order was issued. Six inches of sand was spread on the bottoms for stable bedding, and a relay of men sprayed the animals with two-inch fire hoses to keep them comfortable during the hot crossing. We debarked at Battipaglia, Italy, late September 19 and were trucked to an assembly area near Monte Carvino Revello.

Orders were received to organize a mountain artillery battery of four pack 75mm guns. Personnel was furnished by the division artillery battalions, and 125 mules were assigned to the unit, the 3d Provisional Pack Artillery Battery. An original cadre of 16 enlisted horse-and-mule tenders at San Stefano had ballooned into a fair-sized squadron which comprised a powerful and mobile unit for mountain operations.

The first reconnaissance mission was performed on September 21: "Reconnoiter roads lanes and draws approaching Acerno, Italy."

Mines, blown bridges and rugged terrain slowed the advance of the infantry, but proved no barrier to the mounted troop which was able to cut across country at will. The main road, for instance, was so heavily mined for three and a half miles that no vehicle could travel until the engineers cleared the road, an operation which lasted four hours. All avenues were reconnoitered without mishap. Information regarding roads, mountain passes and terrain, and absence of enemy was sent to the division.

The troop then was instructed to reconnoiter hills surrounding Acerno. This assignment consisted of scouring the hill mass beyond town, scouting out draws, possible observation points and likely defensive positions. One of our patrols ran into enemy fire. The troop was immediately organized into a series of strong point positions in order to maintain contact. Several horse-and-foot patrols were sent out to determine the location of the enemy's flanks, his composition and strength. A fairly accurate estimate was made from patrol reports and observers.

Contact was maintained until the arrival of the 1st Battalion, 7th Infantry, which relieved the troop in position. From the information furnished, the battalion was disposed for an attack. The mule pack train swung into action and supplied the infantrymen during a successful three-day engagement.

Mountain operations continued throughout the rest of September, 1943, about four days. Throughout the period, the troop led the infantry regiments on the 39-mile division advance from Acerno, through Montella, Volturara, Atripalda and San Maria. It descended from the mountains only to reconnoiter and pass through the towns of Avellino, Maddaloni, and Caserta.

A breathing spell was afforded at Caserta, when preparations for crossing the Volturno were necessary before a further advance. The time was used in shoeing, caring for animals and equipment, readjusting personnel, weeding out unsuitable animals, and obtaining replacements. By crossing time, the mounted force was in tip-top condition.

Mounted troops crossed the river in the wake of the 15th Infantry at Triflisco, and moved to the town of Villa San Crose, October 13, 1943. The pack artillery went into position as support for operations of the reconnaissance troop. The troop in advance of the 1st Battalion, 7th Infantry, moved toward Marjorano, swung wide of a mountain which it was impossible to climb within the time schedule, and approached Marciano, a small village.

At the edge of town, a stone wall, a stone house and two haystacks in a field was observed—a likely enemy position. Mortar fire that was thrown in ignited one of the haystacks, and stirred up a hornet's nest of enemy, estimated at 75 men armed with machine guns, machine pistols and rifles. Our "peashooting" artillery and the troop riflemen killed 26, wounded five, and captured nine of them. Our losses were one killed and eight wounded. The door now was opened for the infantry to advance to their objective unmolested.

Following this engagement, the troop paced elements of the division to the town of Dragoni. Ordered to the left flank of the division, the troop cut five miles across country to Rocca-Ramona. Upon arrival at posts of observation, the artillery was placed in position to support the troop's attack on the town. Twice the troop went in, and twice it came out. Because of enemy superiority in men and firepower, our force could not hold the town. The 2d Battalion, 15th Infantry, arrived and Major General (then Brigadier) William W. Eagles, commanding the regiment, ordered a coördinated attack. This time the town was held and several counterattacks were repulsed.

The area was now cleared of enemy, and so the troop was ordered into rest for a day at Riardo. Under constant enemy artillery fire, the troop shoed animals and performed other "housekeeping" details attendant to horse operations.

The following day, the troop seized and held Poza, about eight miles away, without encountering the enemy.

From Poza, reconnaissance was pushed west and north. One of the reconnaissance patrols discovered the city of Roccamofina, in British territory, was clear of enemy. A message was dispatched to Teano to the commanding general, 56th British Infantry Division, who expressed thanks for the information. He remarked that he was preparing his artillery and infantry for an attack on the town, and that our reconnaissance information had moved his troops forward one full day.

Poza was soon occupied by troops of the 7th Infantry, and the mounted troop was ordered to seize and hold Toro, eight miles from Poza, and directly across Highway 6 from Presenzano.

We received enemy fire from a stoutly defended road block at the edge of Toro, and because the division had several other routes available that were well inside its zone, we by-passed the resistance and moved to Foresto, less than a mile away, which was not occupied by the enemy. The division commander changed our orders and directed us to occupy Foresto, which was a better location for operations than Toro. Both towns were equal in elevation, and vantage points in Foresto afforded complete observation of Toro and enemy installations beyond.

Reconnaissance patrols and observation posts discovered that the enemy installations were comprised of two self-propelled guns and many dismounted men armed with automatic weapons and rifles, which were located just west of Toro. This information was sent to division headquarters, and the following instructions came back to the troop: Establish radio contact with fire direction center; division artillery and observers from the troop will direct fire; the troop will attack Toro following an artillery preparation.

The attack was successful. Enemy casualties were nine killed and wounded. We captured both self-propelled guns, a variety of small caliber weapons, and rations enough to feed the troop three meals. Following the action, the infantry advanced, and division headquarters moved into Presenzano without interference.

The smoke of this scrap had hardly cleared before the troop was ordered into the hills beyond Presenzano to reconnoiter to Mount Cesimo for the 1st Battalion, 30th Infantry. The troop arrived at the base of the 1,300 meter mountain without trouble, and the battalion commander was informed. He immediately sent his Company C forward to seize and occupy the hill. The company stormed the hill twice and was driven back both times because of enemy superiority in numbers and terrain which favored the defenders.

A coördinated attack was ordered, and while the infantry tried the face again, the mounted troop struck deep on a flank. Our mounted men were able to work more than halfway up the mountain with their horses, zigzagging up rocky trails that were extremely difficult for foot troops. From an overhanging ledge on the forward slope of a ridge on the enemy flank, the troop delivered direct machine-gun fire. Our mortars dropped in rounds from the reverse slope of our ridge. The flank finally softened, and was rolled back before the infantry's frontal attack.

Our next mission was to cross Cannavinelle Mountain and reconnoiter the town of San Pietro. This operation climaxed the career of the mounted reconnaissance troop. Sustained operations, lack of facilities for animal upkeep, and inability of replacements to reach the troop, had cut the strength to 76 fighting men. The movement from Mt. Cesimo to the crest of Cannavinelle was executed rapidly and without contact. Darkness came and the troop secured itself for a quiet night.

But at dawn—and from three sides—a mass of German green-grey studded the landscape. (This was going to be one hell of a scrap.)

The troop was well dispersed and in good defensive positions on an arc resembling an egg-end. The four machine guns were in position to cover the entire field. The mortars, at the bottom of the hill, were ready to deliver surprise fire. All men had good cover and plenty of ammunition. No artillery was available. It was to be a small-arms contest.

The first shot was fired at 0645 hours. About noon, the troop passed from the defense to the attack, and by 1500 hours had captured the hill. The score was 65 enemy killed, 29 wounded, and 11 prisoners "in one piece." Our losses were 11 killed, and 14 wounded, two of whom died. Animal losses were 31 horses and mules.

The town of San Pietro was observed but not entered. With the mission partially accomplished, the infantry took over our positions and we were ordered into a defensive position at Ceppagna.

We were withdrawn for a rest on Armistice Day, November 11, 1943. Eight more days of travel put us in a real rest area where the battle weary troopers were happy over a job well done—59 days of continuous action, except for a day of horseshoeing under artillery fire.

CONCLUSIONS

1. Horse cavalry can play an important rôle in mountainous terrain which is unsuited to vehicle operation.

2. Its high degree of cross-country mobility gives a mounted unit freedom of action denied all elements except infantry.

3. Coördinated with infantry, horse cavalry develops a shock power which is difficult to overcome before foot elements apply the battering pressure usually required to subdue a stunned enemy.

4. Italy will sustain mounted operations, although few central grain stock piles can be expected. In rural districts, forage is moderately plentiful.

5. Equipment and supplies, such as saddles and horseshoes, present no problems which can not be easily solved by including animal equipment and supplies in regular quartermaster supply lists.

THE HORSE'S PLACE IN OUR FUTURE

by Colonel Fred W. Koester

Regardless of the extent to which it may figure in our postwar Army, there can be little doubt that the horse will have a definite and important part in the future of our nation. Logical reasoning indicates this—facts prove it.

PARADOXICAL though it may seem, scientific advancement, frequently regarded as the natural enemy of the horse, has, in fact, been responsible for the new and increasing importance assigned this animal. Revolutionary developments in transportation, communication, and other fields have greatly altered world affairs. Nations have been brought much closer together. There is little or no opportunity for isolationism. Wars, instead of being conflicts between two or a small group of nations and confined to rather local theaters, have now become global affairs with all nations directly or indirectly involved. Instead of armies being largely composed of professional soldiers, nowadays everyone, without regard to age, sex, or station, becomes a soldier, actual or potential. If they don't serve on a fighting front, they will likely be engaged on the home front but, in any case, they must be prepared for service.

In such a world, the physical fitness and aptitude of our citizens become of paramount importance. To build and maintain a strong, vigorous, active manhood and womanhood is both a necessity and an obligation. Because it involves our national security, the obligation is properly that of the agency charged with our national defense.

The late war taught us that our average present-day American can stand considerable physical improvement. Modern life with its abundance of luxuries and conveniences is not conducive to physical fitness and ruggedness. Something is necessary to get our people out of automobiles and airplanes, off the city streets, and into the country where they may develop the stamina, self-reliance, and mental alertness that come from spending some time in the open. Now, while no single medium can accomplish this objective, it is certain that none can contribute more to the physical betterment of more people in more localities and under a greater variety of conditions than can the horse.

Why is this true? To begin with, the horse is a great motivating influence. It accounts for a multitude of wholesome sports and recreation such as horse shows, hunting, hunter trials, polo, jumping, schooling, all forms of racing—including harness, flat, steeplechasing, etc., rodeos (which in 1945 ranked third among all amusements in aggregate attendance), trail rides, and a wide variety of other equestrian competitions. These engage or attract people of all ages, both sexes, all colors, all creeds, all stations, and all localities, in all climates, and at all times of the year. It has been conservatively estimated that some 45,000,000 Americans have regular contact with horses, and thus derive some physical betterment or mental relaxation from the association. Our horse "industry" reaches into every state, every county, and every city or hamlet, and has an estimated aggregate value of more than $2,000,000,000. Thus, there is ample factual basis for emphasizing the importance of the horse to the physical welfare and contentment of a large proportion of our citizens.

There is other concrete evidence too. For example, California, recognizing current horse trends as well as its obligation to its people, recently appropriated $300,000 to begin work on a state-wide trail system, 1,500 miles in length which, when completed, will be without parallel either in this country or abroad. Other states are contemplating similar measures. Again, hundreds of organized horse groups such as sheriffs' posses, riding clubs, city, county and state horsemen's associations and breeder associations, are forming in all parts of the country. It is reported that 52 horse magazines, with national or semi-national circulation, are published in this country. All forms of equestrian sports, most of which were dormant during the war, are returning either in an expanded form or with programs for postwar expansion. Attendance figures at race meetings, rodeos, and other events featuring horses, are breaking all existing records. Prices paid at breeders' sales, etc., are increasing gradually.

These developments have had a decided effect on the horse industry. The riding horse seems to be replacing the draft horse in relative importance. Some fewer but decidedly better horses are being raised. Selective breeding is no longer a goal but an actuality. Standards of horse husbandry have been tremendously improved. The better horses being raised will have a greater allround utility both for peacetime needs and wartime potentialities. This is of military significance.

Whether we have only a few or no mounted combat elements in our postwar Army, the horse has a definite value as a training adjunct for certain of our military personnel. At some service schools and in some ROTC, National Guard, and other units, horses may be employed profitably. Then, too, we should not lose sight of the fact that Generals Patton, Wainwright, and Truscott, the entire 1st Cavalry Division, and many other illustrious leaders and soldiers of World War II, no matter where or how they fought, were trained in the saddle. A system and a medium that boasts of such products surely must have future value.

The changes which have taken place, as well as the outlook for the future, all enhance the importance of the Remount Service. Originally organized to accomplish necessary procurement as well as administer the Army Horse Breeding Plan, the Remount Service in recent years has become the principal liaison agency between the government and the people of the country in horse matters. As the importance of procurement has decreased, that of breeding has steadily increased.

The Army Horse Breeding Plan inaugurated by a farseeing Congress in 1921 has made a tremendous contribution to the economic wealth of the country. From a modest beginning of 159 stallions standing in 1921, the number steadily increased until 1942 when more than 700 stallions were in service. Between 1921 and 1944, more than 300,000 mares were bred to Remount stallions and produced over 200,000 foals, most of which, except for normal attrition, are in use in the United States today, principally on ranches and farms and for other essential purposes. These are estimated to have an aggregate value of more than $30,000,000. There are many figures available to prove that the Remount Program has been most economical and has given the taxpayers a maximum return for a minimum expenditure.

The Army Horse Breeding Plan, as well as many other Remount activities, serves a dual purpose. While meeting potential military requirements, it also sustains the quality and quantity of the nation's horse resources. It is directed toward reconciling and integrating our national rural economy with possible future security needs while at the same time, seeking to maintain sound rural economical health and balance as one of our national military resources. It recognizes that horses and mules are a by-product of the ranch and farm as is the development of personnel trained to use them. This is a matter of military importance that should not be overlooked.

The Remount Program, too, takes cognizance of the fact "that the outside of the horse is good for the inside of a man," and that widespread use of horses to add to the pleasure, interest, and above all, physical well-being of our manhood and womanhood is an essential and worth-while step in preserving our manpower resources. Again, the program recognizes that, although the need is diminishing in some fields, there is nevertheless a continuing requirement for horses of suitable type in many phases of agriculture, in our great cattle industry, for use in administering our forests, and in many other essential fields where mechanization cannot, for a variety of reasons, replace the horse.

The Remount Service has an international importance too. First, it is an appropriate agency for coordinating the horse and mule requirements of other nations with our own needs and production capabilities. In this connection, it is well to remember that, regardless of scientific developments in our own country, many foreign nations are geared to an economy based on use of animal power and transport. There is no immediate prospect that they can switch to mechanization either with our help or that of others. Finally, in matters involving the defense of the Western Hemisphere, many military authorities agree that there is and will continue to be at least well into the predictable future, a widespread necessity for horses for military uses in most of South and Central America. The principal source for meeting such requirements is the existing pool of fine horses of military type, largely the products of the Remount Program which exists in the United States today. This supply will continue to exist only if the pool is kept filled by a yearly increment of horses such as resulted and may continue to result from the Army Horse Breeding Plan as now operated.

Editorial Comment

To the Editor of the CAVALRY JOURNAL:

FROM my seat on the sidelines I hear various and sundry rumors of the merging of the remnants of the Cavalry with the Armored Force to be called perhaps Cavalry or Armored Cavalry.

In view of the widespread misconception of the events which contributed to the establishment of the provisional Armored Force, I believe it is a proper moment to release the historical truth. Here it is in copies of official communications which tell the complete story.

JOHN K. HERR,
Major General, Retired.

322.02

October 3, 1939

Subject: Expansion of Mechanized Cavalry

To: The Chief of Staff

1. In view of my responsibility to advise the Chief of Staff in matters pertaining to Cavalry, the following is submitted.

2. Since the employment of mechanization in Poland apparently has been on mobile, hard-hitting, flanking missions, and in rapid exploitation of the breakthrough created by the assault of infantry and less mobile troops (all typical cavalry missions); and since such similar employment is visualized for any war of movement in this hemisphere, it is believed that any expansion of mobile, fast-moving mechanization should be charged to the Cavalry arm of the service for development and leadership. It is believed that this should begin immediately and center about the 7th Cavalry Brigade, which has already most of the essential elements needed for expansion.

3. *a.* It is therefore recommended that the 7th Cavalry Brigade be expanded into a Mechanized Cavalry Division as indicated in the accompanying organization charts. This expansion more than doubles the striking power of the present brigade by increasing the number of combat cars from 112 to approximately 500, making it fully the equal of the German Armored Division, while at the same time retaining the greater flexibility in organization inherent in the American Brigade (Charts A, A-1, A-2, A-3).

b. First Increment

In order to accomplish the expansion of the mechanized cavalry brigade into a division with a minimum of time, it is recommended that the delivery of vehicular equipment set up in both 1940 and 1941, for the proposed augmentation of the brigade, be advanced so that this equipment will become available in the calendar year 1940 (Chart B).

c. Second Increment

It is also recommended that this office be authorized to submit supplementary estimates for the additional equipment involved in the further expansion of the 7th Cavalry Brigade into a division and that this equipment when authorized, also be given the priority necessary to insure its delivery in the calendar year 1940 (Chart C).

4. As soon as this first Mechanized Cavalry Division shall have been organized with the requisite personnel and material, it is recommended that the organization of another similar mechanized cavalry division be started without delay.

5. Following these two mechanized cavalry divisions, and if it becomes apparent that the Army of the United States is to be increased to the size of four Field Armies or thereabouts for participation in war, it is recommended that two additional mechanized cavalry divisions be authorized so that the resulting proportion will be one mechanized cavalry division to each Field Army. Inasmuch as the training of mechanized cavalry and the procurement of its equipment require considerable time, consideration should be given these last two mechanized cavalry divisions in the initial stages of any planning for a Four Field Army national defense force.

6. *Personnel*

a. As soon as the expansion of the 7th Cavalry Brigade into a division has been approved it is recommended that all necessary personnel for this increment be ordered to Fort Knox, Kentucky, for training.

b. Immediately upon delivery of the equipment for the first Mechanized Cavalry Division, it is recommended that 25% of the personnel necessary for the succeeding division be sent to Fort Knox, Kentucky, for training with the then available equipment, in order to prepare this cadre for the organization of the second mechanized cavalry division in a minimum of time.

c. Upon the authorization of each successive mechanized cavalry division, it is recommended that this same practice be followed; that is, ordering 25% of the personnel of each successive division to Fort Knox, Kentucky, for training as specialists and key men.

d. With reference to this increased personnel for Fort Knox, Kentucky, conference with the Commanding General of the 7th Cavalry Brigade, this date, indicates that facilities exist on that reservation for the initial increase as indicated.

7. The importance of the immediate expansion of mechanized cavalry in the United States Army is indicated by the wide use of German mechanization in Poland. Although the details of this employment are not yet known, it is evident from all reports that German mechanized forces were extensively employed in this rapid and decisive campaign. In view of this fact it is believed that four mechanized cavalry divisons, as

indicated in this project, would provide a reasonable amount of this essential mass of highly mobile, hard-hitting forces in event this country becomes involved in war.

8. The designation of the 7th Cavalry Brigade at Fort Knox, Kentucky, as the nucleus of this expansion is based upon seven years experience in mechanized cavalry at that post.

9. It is recommended that the personnel requirements for this project be considered in any and all progressive augmentations of our ground forces. Inasmuch as mechanization is designed to increase the scope of existing arms and not to replace them it is not considered that personnel should be provided from any existing units of any arm but should be in addition thereto. It is believed that Congress and the American public, when faced with the realization that the United States lags far behind all first-class powers of the world in quantity of mechanization, will be quick to favor any emergency measures necessary immediately to obtain additional personnel as well as equipment for a substantial increase in our mechanized strength. When consideration is given the fact that except for a few scattered tank companies and two or three incomplete battalions, our entire army includes only one mechanized brigade, as contrasted, for example, with at least 10 German armored divisions, the urgency of this situation cannot be escaped.

10. In conclusion, it is believed that existing military thought in the United States with reference to what constitutes the correct proportion of mechanized cavalry in a balanced and mobile force, should now be revised in order to accord this type of cavalry the importance and size it merits.

11. The Commanding General, 7th Cavalry Brigade, has been consulted and concurs in the above. The provisions for the early training of personnel are his specific recommendations and are considered by him to be especially essential for an orderly expansion.

J. K. Herr,
Major General, U. S. Army,
Chief of Cavalry.

(The memorandum of G-3 referred to below asked for comments in the question of establishing an armored corps.)

June 3, 1940

MEMORANDUM FOR THE ASSISTANT CHIEF OF STAFF, G-3

Subject: Mechanization

1. Reference your memorandum of June 1, 1940, on the above subject (C-3/41665), the following comments and recommendations are submitted:

2. *Comments*

a. The present policy of assigning mechanization to the several arms is sound.

b. Lack of funds, not the absence of a separate corps, has delayed the expansion of mechanized units. In this connection attention is invited to my memorandum to the Chief of Staff on October 3, 1939, subject: Expansion of mechanized cavalry (322.02), urging the immediate and orderly expansion of the 7th Cavalry Brigade into a mechanized division of the same approximate power as the German Panzer Division to be followed by the successive formation of three similar divisions.

c. Examination of the employment of German armored divisions both in Poland and France shows clearly that they were used on Cavalry missions, particularly exploitation after the breakthrough. There is no valid reason for setting up a separate corps for the development and training of units to be used in the execution of cavalry missions.

d. The corps reconnaissance regiment, as well as the mechanized cavalry brigade, has been developed by the cavalry, is proving successful, and should remain assigned to that arm.

3. *Recommendations.*

a. That no separate Armored Corps be established.

b. That the 7th Cavalry brigade be designated a mechanized cavalry division and expanded without delay.

c. That additional mechanized cavalry divisions and corps reconnaissance regiments be provided in proportion to successive increases of the army.

J. K. Herr,
Major General, U. S. Army,
Chief of Cavalry.

320.1

December 7, 1940

MEMORANDUM FOR THE ASSISTANT CHIEF OF STAFF, G-3

Subject: Organization of the Armored Force, Your G-3/41668, AG 320.2 (10-2-40), November 19, 1940

1. I do not concur with the recommendations of the Assistant Chief of Staff, G-3.

2. For obvious reasons my remarks will be confined to his recommendation that the Armored Force be established as a separate arm of the service without further delay. As a basis for my conclusions and recommendations, I will review the facts bearing on this situation in chronological sequence.

3. In the report of the Chief of Staff, U. S. Army, 1932, the following broad policies governing the development of mechanization in the Army were announced as follows: "Every arm is authorized to conduct research and experimentation with the view of increasing its own power to perform properly the missions it has been especially organized and developed to carry out. Every part of the Army will adopt mechanization and motorization as far as practicable and desirable." In conformity with this policy the Cavalry first set up one mechanized cavalry regiment, which was later ex-

tended into the 7th Cavalry Brigade, Mechanized, composed of two mechanized cavalry regiments, with the necessary staff, headquarters unit, and attached supporting arms, including artillery.

4. Continuing this sound development step by step the Chief of Cavalry on July 8, 1937, recommended the formation of a cavalry division, mechanized. This was approved by the War Department for planning purposes only; that is, it was regarded as a paper organization and no equipment was authorized. This status continued until 1939, when the present Chief of Cavalry in the hearings before the War Department Budget Advisory Committee on the equipment to be procured in 1940 asked for all the matériel and equipment necessary to increase the 7th Cavalry Brigade, Mechanized, to the division strength of about 3,000 set forth in the organization approved for planning purposes, amended by conference and concurrence with the Commanding General, 7th Cavalry Brigade. This request was supported by the fact that the then Chief of Staff had stated before Congressional committees that this brigade would be increased to a division. The Budget Advisory Committee was about to approve the estimate when the following development threatened to sabotage the project.

5. The Assistant Chief of Staff, G-3, having submitted a memorandum to the Chief of Staff, recommending approval in principle of the expansion of the 7th Cavalry Brigade, Mechanized, into a mechanized cavalry division along the lines previously indicated, informed the Chief of Cavalry as follows:

> May 12, 1939
>
> MEMORANDUM FROM THE A.C. OF S., G-3
>
> Subject: Mechanized Cavalry Division
> (G-3/6541-Cav-36, May 2, 1939)
>
> The Chief of Staff disapproved the action recommended in the memorandum cited above, which is returned herewith. The Chief of Staff is opposed to further expansion of the mechanized brigade into a mechanized division, and desires that any planning towards further expansion of mechanized units be along the lines of an additional brigade in general similar to the present 7th Cavalry Brigade.
>
> By direction of the Chief of Staff:
>
> (s) H. R. Bull,
> Lt. Col., General Staff
> Secretary, General Staff.

6. As a consequence of this the Assistant Chief of Staff, G-4, informed the Chief of Cavalry that, inasmuch as the Chief of Staff had disapproved the formation of a mechanized division, the matériel and equipment asked for by the Chief of Cavalry to equip the division would not be approved by the Budget Advisory Committee. The Chief of Cavalry then, by personal interview with the Chief of Staff, obtained the concession that he really wanted all this equipment no matter what the development might be. By personal interviews with the Assistant Chief of Staff, G-4, and the Assistant Chief of Staff, G-3, after stating the view of the Chief of Staff, the Chief of Cavalry was able to save this equipment which finally passed, not only the War Department Budget Advisory Committee, but the Bureau of the Budget. This equipment was the first equipment available in the present expansion and would not have been available except for the efforts of the Chief of Cavalry.

7. The next step to further the development of mechanized cavalry was the result of European developments in mechanization as shown in combat. Beginning in 1938, when he came into office, the Chief of Cavalry had initiated an intensive study of all European mechanization. He had requested and secured from the Assistant Chief of Staff, G-2, up-to-date summaries of the mechanization of all leading powers. In addition, he had submitted questionnaires which were sent to military attaches to secure data to fill in the gaps. This included every phase of mechanization; organization, training, equipment, armor, armament, and everything that could be learned. The organization of the Panzer Division was studied in the most complete detail. The Chief of Cavalry had also secured the detail in his office of officers from mechanized cavalry who were completely familiar with all the details of mechanization and training in the 7th Cavalry Brigade. One of these officers had been the brigade executive and G-3 for the preceding three years and had written every problem executed by this force. Complete files were set up and kept up to date. In the summer of 1939, the Chief of Cavalry called into conference with him the Assistant Chief of Staff, G-3, and Colonel Truman Smith of G-2, who was intimately familiar with the details of German organization, and endeavored to inform thoroughly the new Assistant Chief of Staff, G-3, as to the organization and purposes of the German Panzer Divisions and to sell him the idea that there was a great likelihood, in view of the international conditions, that this country in any expansion of our forces, would need American mechanized divisions more or less similar to the German Panzer Division. It was also impressed upon the Assistant Chief of Staff, G-3, that these divisions were really armored cavalry and that any development in our Army of such mechanized elements should naturally and properly be under the supervision of the Chief of Cavalry. He appeared to concur.

8. Immediately after the Polish campaign, the Chief of Cavalry, on October 3, 1939, submitted to the Chief of Staff a memorandum, subject: Expansion of Mechanized Cavalry, copy of which is attached hereto, and marked Incl. No. 1. It will be noted that, in this recommendation, the Chief of Cavalry proposed that the deliveries of all equipment for a division of 3,000 men scheduled for 1940-1941 delivery be speeded up for de-

livery in 1940, that he be permitted to submit supplementary estimates for additional equipment necessary to increase the 7th Cavalry Brigade into a division of the approximate strength of the German Panzer Division of about 10,000 men, and that it be given the priority necessary to assure its delivery in the calendar year 1940. Complete charts of recommended organization accompanied this memorandum.

9. It was recommended also that, as soon as the first mechanized cavalry division had been organized with the requisite personnel and matériel, the organization of another similar mechanized cavalry division be started without delay; that following the organization of these two mechanized cavalry divisions, if it became apparent that the Army of the United States was to be increased to the size of four field armies, two additional mechanized cavalry divisions be organized so that the resulting proportion would be one mechanized cavalry division to each field army; and that, inasmuch as training of mechanized cavalry and procurement of its equipment required considerable time, consideration should be given the last two mechanized divisions in the initial stages of any planning for a four field army national defense force. It further stated that the missions of this force were typical cavalry missions and that any such expansion should be charged to the cavalry arm of the service for development and leadership. It also stated: "It is believed that Congress and the American public, when faced with the realization that the United States lags far behind all first-class powers of the world in quantity of mechanization, will be quick to favor any emergency measures necessary immediately to obtain additional personnel, as well as equipment for a substantial increase in our mechanized strength. When consideration is given the fact that, except for a few scattered tank companies and two or three incomplete battalions, our entire army includes only one mechanized brigade, as contrasted with at least 10 German armored divisions, for example, the urgency of this situation cannot be escaped."

10. This was the first concrete recommendation made by anyone, so far as I know, for the establishment of American divisions of this type. No one in the 7th Cavalry Brigade had suggested anything of the sort and were still thinking in terms of the small division of about 3,000 men. It so happened that General Chaffee, then in command of the 7th Cavalry Brigade, was in Washington at the time. This memorandum, with its accompanying tables, had been completed and he was requested by the Chief of Cavalry to confer with him and express his concurrence or dissent. After suggesting one or two very minor alterations, he agreed to concur and the Chief of Cavalry so stated in the last paragraph of his memorandum.

11. Immediately after the submission of this memorandum of October 3, 1939, there began an attempt to prevent the Cavalry from securing control of this development. Although there may have been some who honestly believed in a separate armored force, it is believed that the bulk of this agitation was on the part of those non-cavalrymen, some of whom had served in tank battalions, who saw themselves excluded from gaining high positions in armored corps and divisions. A whispering campaign was begun to the effect that the Chief of Cavalry, being an ardent horseman, would not develop mechanization. As has been shown hereinbefore, there was no foundation in fact to these whisperings. Meanwhile, no official recognition was given to the far-reaching recommendations made by the Chief of Cavalry in the memorandum of October 3, 1939. On the contrary, the G-3 section of the General Staff began to pester the Chief of Cavalry with memoranda requiring him to state where he was going to get the personnel to man the mechanized equipment which was coming up in 1940 and prescribed the restriction that he must get this personnel from the strength which he then had. In other words the idea was to force the break-up of horse regiments to man the very equipment salvaged by the personal intervention of the Chief of Cavalry. Inasmuch as the Chief of Cavalry could see the need in the near future for all the horse cavalry he then had, plus considerably more, in addition to a great expansion in armored cavalry, he resisted this rather petty effort of trying to force him to rob Peter to pay Paul. (See attached copy of memorandum of Chief of Cavalry to the Chief of Staff, April 10, 1940, and marked Incl. No. 2.)

12. Meanwhile, although a separate armored force had been rejected by the War Department on previous occasions, the proponents of a separate force continued to agitate this matter. This apparently came to a focus at the close of the maneuvers in Louisiana in May 1940. Both the Chief of Infantry and the Chief of Cavalry attended these maneuvers. The Assistant Chief of Staff, G-3, failed to invite them to attend a conference which he called to consider the subject of mechanization and to which he invited a few officers of more or less experience in tank battalions and in mechanized brigade.

13. Immediately thereafter in a memorandum of June 1, 1940, the Assistant Chief of Staff, G-3, to the Chiefs of Cavalry and Infantry, subject: Mechanization, copy of which is hereto attached, marked Incl. No. 3, requested their views on a change in the present policy of mechanization, particularly as to the advisability of setting up a separate armored force. Both the Chief of Cavalry and the Chief of Infantry declared themselves to be opposed to a separate armored force. Attached hereto is a copy of the memorandum of the Chief of Cavalry, marked Incl. No. 4. Following are extracts of the report from the Chief of Infantry.

> "The Panzer units are in effect armored cavalry. The Chief of Infantry urgently recommends that no precipitate action be taken in this matter, but that all aspects be given careful consideration. The fallacy of shaping organization on the basis of weapons, rather than adapting weapons to the

> mission, is a constantly recurring one. It was seen in the World War in the machine-gun corps of the British Army, which a large group in the American Army wanted to adopt for our service. The present basic policy of tank development was laid down by General MacArthur in his memorandum of May 1, 1931. It was one of the soundest documents ever promulgated by the War Department. It lays down the principle that development of weapons and units should be based on mission."

14. I quote also a paragraph from confidential letter to the War Department, dated September 15, 1939, from the Commanding General, 7th Cavalry Brigade, subject: Some Observations and Recommendations Pertinent to Any Future Expansion and Development of Mechanized Cavalry which may be Contemplated by the War Department, as follows:

> "To me, the basic determination of the War Department to develop the mobile mechanization as cavalry and with cavalry conception and leadership, and to develop the immediate tank assistance to assaulting infantry as infantry and by the infantry tank service—which basic determination was confirmed by the Gruber study in G-3 of the War Department—has been again shown, both by the Plattsburg maneuvers and by the German operations in Poland, to be an essentially sound solution under our law and should be continued."

15. On June 5, 1940, in a memorandum to the Chief of Staff, subject: Expansion of Mechanized Cavalry, the Chief of Cavalry renewed his recommendations of October 3, 1939. Copy of this memorandum is hereto attached and marked Incl. No. 5.

16. On June 5, 1940, the Assistant Chief of Staff, G-3, in a memorandum to the Chief of Staff requested that the following named officers be ordered to Washington and report to the Chief of Staff for consultation in connection with organization matters pertaining to mechanization: Brigadier General Adna R. Chaffee, Brigadier General Bruce Magruder, Brigadier General C. L. Scott, and Lieutenant Colonel S. E. Brett. The last named officer announced to all before leaving Fort Leavenworth that he was going to Washington to advocate a separate armored corps.

17. On June 7, 1940, the Assistant Chief of Staff, G-3, issued a memorandum calling for a conference on June 10, 1940, at 10 A.M., of chiefs of general staff sections, arms and services on the subject of armored equipment and organization in the Army. Generals Chaffee, Scott and Magruder and Lieutenant Colonel Brett were present. When this conference was called the Assistant Chief of Staff, G-3, stated that the discussion was wide open, except on one point; i.e., that the Chief of Staff had decided that two divisions would be formed, one at Benning and one at Knox, utilizing the mechanized elements of both Cavalry and Infantry for this purpose. In the ensuing discussion the Chief of Cavalry again expressed himself as being opposed to a separate armored force, stating that the present policy was a sound one, that is, permitting each arm to develop its own mechanization to execute its mission; that there was no doubt the missions of the Panzer divisions were cavalry missions; that he was in no struggle for power, but that the question seemed to be largely whether fast-moving mechanization would be dominated, as in the German Panzer Corps, by men of cavalry training, or whether it would be submerged by having in key positions men of other branches; and that he was aware of certain conspirators, some of them in the General Staff, who had been working all along for a separate armored force chiefly as a means to their own advancement. Lieutenant Colonel Brett was the only one present who directly declared for a separate armored corps. This meeting was adjourned to meet in the afternoon. Word was sent around that it would not meet that afternoon, but some time later when notice would be given. Insofar as the Chief of Cavalry and the Chief of Infantry were concerned no additional meeting was ever held. I happen to know, however, that the four representatives of the 7th Cavalry Brigade and of the tank units who were present at the first conference were called together in a series of meetings and discussions in secret conclaves with the Assistant Chief of Staff, G-3, at which time they apparently wrote their own ticket for the formation of an armored force to be set up as an experimental field organization.

18. On July 10, 1940, a memorandum was issued by The Adjutant General, subject: Organization of the Armored Force, which not only set up an experimental field force of one armored corps, but allotted to the Chief of the Armored Force and the Commander of the Armored Corps practically all the duties of a chief of branch.

19. On July 10, 1940, the memorandum of the Chief of Cavalry to the Chief of Staff (copy hereto attached marked Incl. No. 3), dated June 5, 1940, subject: Expansion of Mechanized Cavalry, hereinbefore mentioned and repeating the recommendation of the memorandum of the Chief of Cavalry to the Chief of Staff, October 3, 1939, was returned by 1st Indorsement as follows:

> 1st Ind.
>
> "AG 320.2 (6-5-40)
> M Ret C
>
> War Department, A.G.O., July 10, 1940—To: Chief of Cavalry
>
> In general, the recommendation of the Chief of Cavalry have been incorporated in the Armored Division organization.
>
> By order of the Secretary of War:
> Adjutant General."

20. Thus after more than nine months of delay in a critical world situation the Chief of Cavalry was notified that an armored force was being set up to try to accom-

plish in frantic haste practically the same objective that had been recommended on October 3, 1939, by the Chief of Cavalry to be accomplished in a sane, orderly, and constructive manner.

21. The Assistant Chief of Staff, G-3, now recommends in this basic paper that, because he believes this force has admirably fulfilled its mission of initial organization and has successfully passed through the experimental stages of its existence, in the interest of efficiency it should be legally established as a separate arm of the service. There appears to be nothing in the accomplishments of the Armored Force as such including the establishment of a Force Headquarters, a liaison officer in Washington, a school, a board, and a replacement center, which, given the necessary funds, personnel, and matériel, could not have been accomplished equally well or better through the established agencies of the War Department.

22. So far as the tactical units of the Armored Force are concerned, the armored divisions have not been completely equipped nor have the individual soldiers been fully trained. Least of all have the divisions progressed to the point where they can be tested by exercises and maneuvers to determine whether or not the equipment and organization are satisfactory. I have grave doubts as to whether the changes in armor and armament in the light tank have improved these vehicles for employment as armored cavalry. The light tank of the Panzer division weighs 7½ to 9½ tons. The heaviest armor of this type tank does not exceed 4/5 of an inch. Our light tank, as modified, now weighs 13½ tons, armor thickness 1 to 1½ inches. The German medium tank varies in weight from 20 to 22 tons. The thickest armor is 1 3/5″ and varies to ¾ of an inch. Our present medium tank, as modified, has a weight of 25 tons and armor thickness of 1½ to 2 inches. The proportion of light to medium tanks in the Panzer corps is three to one. The proportion of light to medium tanks in the American corps is a little more than two to one. It has been claimed that the present American light tank is too heavily armored for its present chassis. Other criticisms have been made. It is very unlikely that the American armored division is as mobile as the Panzer division, chiefly because of the heavier weight of the tanks. It is a matter of grave doubt that it will be sufficiently mobile to execute cavalry missions on this continent and in this hemisphere. Before it can be said that this force has successfully passed through the experimental stage of its existence it would seem that all these matters should be thoroughly examined.

23. The Assistant Chief of Staff, G-3, also states that, while the chief of the Armored Force is charged with all the functions of a chief of arm, he is handicapped in the performance of his duties by not having full authority vested in the chief of an arm by the National Defense Act. This is a plain admission that a separate arm has already been set up, without the sanction of the law, or rather by evasion of the law. because the intent of the National Defense Act is to set the metes and bounds of the organization of the Army of the United States and any wide departure therefrom should obviously first receive sanction by legislation.

24. There appear to be two specific violations of the provisions of the National Defense Act: First, that part of Section XVII which states, "Hereafter all tank units shall form a part of the Infantry," Second, that provision of Section XVIII which states that "the enlisted men of the cavalry shall be organized into cavalry units as the President may direct." The two cavalry regiments were organized into two light armored regiments.

25. *Conclusion:* There is no need for an armored force as a separate arm of the Service.

26. *Recommendation:* Before any final decision is made in this matter a more thorough review should be made concerning the progress of the armored force under present direction, to include extensive exercises and maneuvers over all kinds of varied terrain after the armored divisions are presumed to be adequately trained and equipped.

J. K. HERR,
Major General, U. S. Army,
Chief of Cavalry.

* * *

To Former Members of the Armed Service

Quite often we receive letters from our former subscribers telling us that they are now separated from the service and asking if they can still subscribe to the JOURNAL.

Yes, indeed you can. Any civilian can subscribe to the CAVALRY JOURNAL. The only difference is that you are not a member of the U. S. Cavalry Associaton, and, therefore, not entitled to a vote in the affairs of the association.

All you have to do is send us your home address, and we will do the rest.

* * *

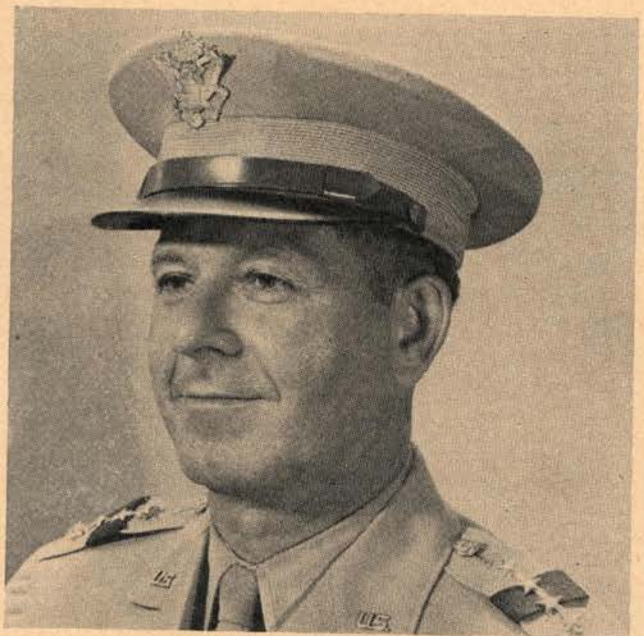
This issue of THE CAVALRY JOURNAL goes to press with the name of one of its highly esteemed staff members, Mrs. Evelyn S. Drayton, Book Editor, missing from the masthead.

Mrs. Drayton resigned her position with the JOURNAL early in April, after having served it for several years with: a "military rating of superior." Her new position is with the Army Institute of Pathology, Washington. Her place on the staff is being filled by Mrs. Elizabeth C. Hoover.

Mrs. Drayton was devotedly loyal to the JOURNAL. To her the magazine not only came first, it *was* first —and she was steadfast toward both those ends. In the performance of her tasks, which besides the book editorship included sundry others requiring a meticulous attention, her work was excellent.

For her, in behalf of ourselves and our subscribers whom she served in many ways, we will always wish the very best.

OTHER BRANCHES


General Jacob L. Devers

Signal Corps Photo

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Every great soldier must be an expert in his own specialty—cavalry, artillery, armor, infantry, engineer, or any of the services or combat arms — and have a full, useful knowledge of the other combat arms and services.

The knowledge alone is not enough. It must be up-to-date, and his thinking must be progressive. He must be able to project his plans beyond today's knowledge. He must anticipate, if he is to contribute his full worth to security of our nation.

Consequently, a step like "Other Branches" is a step in the right direction—giving knowledge of other arms and services to our modern soldiers. It can only be as good as its research and contributors. It deserves our hearty and active support—and it will merit our regular reading.

Jacob L Devers

Commanding General,
Army Ground Forces.

THE AMERICAN INFA

by Major General

Commandant,

Signal Corps Photo

With smoke from blasted German armor filling the sky, American Doughboys follow their armor on the road to Fontainebleau just before the liberation of Paris.

WHEN the European war started in 1939 there is little doubt that the Germans had the most advanced picture of the capabilities of armored forces. The German General Guderian was the leader of world military thought on this subject, with the British General J. F. C. Fuller a close second.

The armies which followed the Guderian teachings did so blindly and rigidly. This blind faith was undoubtedly increased by the astonishing initial successes of his theories.

The German habit of doing things by rote and lack of flexibility worked heavily to their detriment as allied countermeasures came closer to providing an effective answer to the German tank theory. Over long periods the losses the Germans suffered continued to be almost net losses—so many tanks, so many men, so much tactical or strategic advantage.

Our army, on the other hand, from Tunisia to Okinawa, took its losses thinkingly. Against those losses they usually could make a credit entry—"This thing we have learned; next time we will do this." And the losses saved by this open-mindedness and mental flexibility may well have overbalanced those we suffered in learning lessons.

Infantry and armor finished the war with an ability to coöperate which was almost unbelievable to those who had opportunity to see how deficient they were in this respect in the early stages of the war.

That deficiency, which characterized the non-armored infantry divisions and the independent armored battalions, was due primarily to a lack of material for proper combined training of the two arms. It did exist, however, and caused us losses. Tunisia for instance, still furnishes sad and bitter memories to many.

It is a primary responsibility of those charged with the training of these two closely related and highly interdependent arms, that this same defect does not exist should we be faced with a future war.

AMAZING MENTAL FLEXIBILITY

In studying the factors affecting future training at The Infantry School a most encouraging one stands out prominently in the experience reports available. That factor is the amazing mental flexibility of the American soldier and the speed and relative ease with which he was able to abandon any preconceived ideas he might have had and adopt new ones to fit the situation at hand.

He fought each battle as he came to it. When the methods he had been taught failed to work he experimented. When his experiments were successful he adopted them as tentative SOP. He unhesitatingly discarded those experiments which didn't work, and just as unhesitatingly modified those which would work when new conditions made them of doubtful value.

When an army of seven million men is built around a nucleus of less than 200,000, it is obvious that the small unit leadership is going to be in the hands of those who are not highly educated from a military point of view and who have few, if any, fixed ideas.

These men depended upon fundamentals, faced the issue as it existed, and made their decisions on the basis of cold fact, leavened with imagination and their compelling desire to save the lives of those who trusted and followed them. This freshness of viewpoint was tempered and kept within the bounds of military soundness by experienced supervision.

When our armor began to see action in North Africa in late 1942 and early 1943, there were widely divergent opinions regarding its capabilities and the proper methods of using it. The German successes in Europe and North Africa had led many to feel that the tank had become king of the battlefield, and the Doughboy was relegated to semi-service duties of cleaning up and

CARDED

NTRY-ARMOR TEAM

John W. O'Daniel

The Infantry School

holding. We had developed the tank destroyer to combat the hostile giant of the battlefield and, in our enthusiasm, had even tentatively conceived for it the mission of running down enemy tanks and destroying them.

ARMOR NOT SUFFICIENT IN ITSELF

We paid heavily in lives and in material to learn that armor, like every other arm, is not sufficient unto itself but must work with other arms not only for its own security but to achieve maximum results from combat.

Beginning in North Africa and continuing through Sicily, Italy, Europe, and the islands of the Pacific, we began to appreciate some of the problems presented by the ever-increasing closeness of the wedding of infantry and armor, and we began to solve those problems on the spur of the moment—and, more often than not, to solve them successfully.

None of those problems is yet completely solved. However, real progress has been made on many of them, and on others sufficient progress has been made to know that the problem exists, which is always a step forward.

Some of the solutions of the various problems which were adopted in combat are given below in quotations from or paraphrases of reports received from the various theaters. Though one unit is usually cited as the authority in each case, the same method frequently was employed by many other units.

The basic problem was the need for mutual understanding and confidence of infantry and armor, which are the real comrades of the battlefield. They must meet the enemy face to face and work together to destroy him.

In Africa, Sicily, and for some time in Italy and Europe, came recurring complaints from the infantry that the tanks had "failed to show up," had "pulled out when the going got tough." At the same time, tankers were making similar complaints about the Doughboy—"They wait for us to win the fight and then they walk up" . . . "They don't take out the antitank guns because the AT guns do not shoot at infantry." Various steps were taken to eliminate these misunderstandings. In Europe it became SOP to attach a tank battalion and a tank destroyer battalion to each division, and the same subordinate units of these attached armored units were ordinarily allotted to the same regiment so that they became acquainted and the mutual confidence grew by leaps and bounds. A number of units—the 175th Infantry was one—gave as many of its infantry as possible a ride in a buttoned-up tank. This not only familiarized the Doughboy with the difficulties of the tanker but gave him a much better realization of the limited vision and field of fire, and tended to reduce his fear of hostile armor. The same methods were used by the 307th Infantry in the Pacific Theater.

ERRORS—AND SOP

Various expedients were adopted to reduce the need for withdrawal of tanks for refueling and resupply. In the hedgerow fighting in Normandy many tank battalions, including the 741st, adopted the practice of using tanks in double teams of two tanks each. The two leading tanks would furnish the infantry support until fuel or ammunition needed replenishing. When these withdrew they would be immediately replaced by the two tanks in rear. This system was kept up in many units throughout the European campaign. It was SOP for town and village fighting with the 736th Tank Battalion as well as with many others. In the Pacific, similar steps were taken.

In the 149th Infantry in the Pacific it was SOP for the infantry company commander and the tank platoon leader to make their initial reconnaissance together and to stay together during the operation.

One of the early errors that led to misunderstanding was commented on in a report from the 7th Armored Group in Europe during late September 1944. The comment told of the failure of infantry commanders to include in their staff conferences and in planning, the commanders of the attached tank units. The result, according to the report, was the assignment of unsuitable tasks to the tanks, and the loss of mutual confidence. It is significant that the last such report noted from the European Theater was made in mid-October 1944 by the XX Corps.

The infantryman's feeling of responsibility for protection of his accompanying armor increased by leaps and bounds. This was probably due to the somewhat selfish knowledge that if he lost one of his tanks he lost a powerful battlefield aid. Whatever the cause, this protection was SOP in all theaters within a short time after the first joint fighting of the two arms. The 1st Marine Division worked out an SOP during the Okinawa campaign. This provided that, when working in rubble or high vegetation, three or four infantrymen would accompany each tank and furnish protection from all sides against suicide attacks or close range antitank weapons; in relatively open country the infantry would furnish the same type of protection by following the tank closely enough to insure visibility—seldom more distant than 300 yards; in canyons and valleys, specific infantry units were designated to take positions along the sides or crest to secure the advance of the tanks.

The extent to which the various expedients adopted to increase mutual confidence succeeded was well exemplified by a statement made by an officer of the 3d Infantry Division toward the close of the campaign. He was asked his opinion of the relative merits of the various tank battalions then doing duty in the Sixth Corps, to which the division belonged. He listed a number of the battalions in the order of his opinion of their efficiency. His questioner then remarked:

"Funny you didn't include the 756th" (the battalion which had been attached to the 3d Division for some time).

"Oh!" he replied hastily. "That's a part of the division. They don't come any better than that."

COMMUNICATIONS A MAJOR PROBLEM

A second major problem, closely related to that of mutual confidence, was that of communications. Within a few days of the landing in Normandy it was general practice to fasten to the outside of a tank a telephone hooked into the tank's intercommunication system. This practice in various forms was continued until the end of the campaign and was also used in the Pacific. Other communication expedients adopted were: the 116th Infantry furnished the tanks with SCR 300 radios which were kept tuned in to the infantry battalion channel; the 761st Tank Battalion sent a liaison officer in a half-track equipped with an SCR 508 radio to infantry regimental headquarters; in the 16th Infantry when the tanks were moving ahead of the infantry, one tank was held back to permit the infantry commander to communicate with the tanks and when the two were together, the infantry company commander would ride in the tank with the tank platoon leader; units of the 6th Army in the Pacific used sound powered telephones in their tanks with about 50 feet of wire run out through the turret ventilator or the pistol port; the 330th Infantry installed SCR 536 radios in the tanks, removing a bolt and running the antenna, previously insulated, through the hole thus made.

Some of the most astonishing variations were observed in the proportions of the two arms allotted for the accomplishment of various missions.

During the early fighting in the Siegfried Line, the Third Armored Group, composed of the 741st and 747th Tank Battalions, was attached to the 28th Infantry Division to constitute a task force with the mission of widening the gap in the German defenses. Initially, German resistance was disorganized and spotty, and considerable success was obtained with a force in which the tanks predominated, with just enough infantry to occupy strategic pillboxes and hold the ground gained. After two or three days the enemy increased his mine defenses and brought in large numbers of panzerfausts and other antitank weapons. The force began to suffer tank losses. The tank and infantry commanders immediately got together, changed their organization and relative strength, and resumed their advance successfully.

The allotment of tanks to infantry varied from as much as battalion for battalion in some stiff fighting in Europe to the allotment of single tanks to infantry companies in the Pacific.

The tankers did not hesitate to abandon their theories of mass use of tanks where the situation required. This was particularly noticeable during the hedgerow fighting in Europe. There, more than a platoon of tanks seldom worked as a unit, and frequently two tanks would be attached to or would support an infantry platoon.

We have seen at what cost the lesson was learned that tanks must be employed with infantry support. But even that costly lesson was calmly tossed overboard by the 67th Armored Regiment shortly before the crossing of the Rhine. Several unsuccessful attacks had been made upon a hostile position which could be reached only across 3,000 yards of open ground. It was finally decided to make an old-fashioned cavalry charge. Two medium tank companies, one light tank company, and an armored infantry company were employed. Supported by artillery, the light tank company moved out first, at about 35 miles per hour. The mediums followed at a slower rate and the armored infantry, on foot, followed these. The position was captured with negligible loss of lives and tanks.

Obviously, there were dangers. There might have been tank traps or mine fields. Reconnaissance to locate them was made. The commander decided it was time to take a chance and employ mass. He was successful.

BATTLEFIELD STORIES

Here is a story from the commander of Combat Command A, Fourth Armored Division: "To capture a bridge we approach it indirectly over secondary roads. The artillery places time fire on the bridge in order to prevent its destruction by the enemy. We move in fast under this time fire with our tanks followed by the infantry in half-tracks. One company of infantry is given the mission of seizing the bridge. The artillery forward observer moves with it. The engineers follow to search for wires and demolition charges. The infantry advances very close behind the time fire. We have had a few wounded by our own fire, but we feel the losses would have been greater with a different procedure and that this method is sound."

Tactical ideas and suggestions flowed in from both infantry and tank commanders throughout the European campaign where the number of tanks was far greater than in any other theater.

The 116th Infantry worked with tanks almost throughout the campaign and contributed a number of ideas. Here is a quotation from a member of that unit, made while the fighting was still at its height:

"Where practicable, we have the infantry and tanks attack from different directions. If we can't, we usually let the infantry follow the tanks at from 100 to 150 yards. The tanks are deployed in depth and all are firing; if the infantry were mixed in with them, they would be in danger from our own fire. As the tanks close on the objective they cease firing and the infantry passes through. Thereafter, the tanks fire only on call or on close and unmistakable targets."

This is from the same regiment during the pursuit phase: "When we make a breakthrough, the leading infantry company is loaded onto the tanks, except for one squad which is put on the vehicles of a platoon of the division reconnaissance troop. The reconnaissance platoon then reconnoiters to the front, closely followed by the tanks with infantry riders."

There was considerable discussion and experimentation in connection with the method of movement of infantry accompanied by tanks.

One of the most novel methods tried was based upon an infantry carrier called "Battle Sled," which was developed by the 3d Infantry Division at Anzio, Italy. Each sled carried one man. Twelve sleds were arranged in two columns of six each and were towed by a tank. The sleds were of armor plate and their use permitted keeping the infantrymen close behind the tank, with a measure of protection from enemy machine-gun fire and ready for instant action.

The commander of the 22d Infantry, 4th Division, was completely sold on the idea of riding his Doughboys on tanks and cited these as some of its advantages:

The infantry is above hostile machine-gun fire, and it offers a more fleeting target and gets some protection from the tank turret; the infantrymen are in good position to toss grenades into foxholes, to protect the tanks from bazooka and AT grenade fire, and to provide better observation for the tank crews; it crosses up the Germans, who teach their men to shoot the infantry following the tanks; when antitank guns are encountered, the infantry can dismount, deploy and knock them out. He cited among the problems involved, the partial disruption of command and staff organization, and the loss of the fire of infantry supporting weapons which could not well be similarly transported.

The 51st Armored Infantry frequently put its Doughboys on tanks but left them off the two lead tanks to reduce losses. They used this method particularly when the action was fast, and when moving through towns against spotty opposition.

Some armored infantry units used their half-tracks to transport infantry only when no opposition was expected. The 35th Tank Battalion, however, when in action with infantry, preferred to have its infantry in half-tracks because of the additional armor protection, which reduced the likelihood of losses from our own time fire. The 110th Infantry, which preferred a similar system, also pointed out that it kept the infantry squads intact and provided some additional safety because the half-tracks could be maneuvered to take advantage of the tank as a cover from small-arms fire.

Our soldiers refused to accept as gospel the dictum that tanks are helpless at night. The 357th Infantry in Europe used to have tanks follow a night attack primarily for the purpose of meeting the anticipated daylight counterattack, but secondarily for their powerful morale effect.

The 3d Infantry Division reported the use of searchlights for illumination of night operations. One platoon of searchlights provided enough light for night operations of an infantry regiment supported by armor. This system was used extensively by the division in the fighting in the Colmar pocket near Neuf Brisac in January 1945.

In the Pacific, the 775th Tank Battalion, harassed by infiltration of the perimeter by night, equipped some of its tanks with spotlights which could be aimed and operated by hand, and spotted them along the outer perimeter. When a noise was heard, the near-by infantry was alerted and the spotlight flashed in the direction. Time after time the Japs were "caught flat-footed and shot before they knew what was happening."

One of the pet aversions of the tanker—wooded country—was the subject of report after report. Our tankers just wouldn't accept any theory that they were useless in any situation.

Here are some experiences on tank operations in woods:

"We have our light tanks follow the infantry to each phase line," said an officer of the 774th Tank Battalion, "one tank section to each infantry assault company. Mine removers follow just behind the infantry and clear paths for the tanks. The infantry checks all clearings for antitank gun positions. When the infantry is stopped, the tanks come forward and spray the opposition until it is reduced."

The Fourth Division, after considerable experience, arrived at the conclusion that the light tank was better for close support in woods than the medium. The 314th Infantry, however, used its mediums to good effect in woods, particularly where hostile tanks were a part of the defense. These hostile tanks would usually be dug-in and practically immune to our tank destroyer fire. This problem was solved by blinding the hostile tanks with smoke from 81mm mortars. This necessitated movement by the hostile tanks to a position from which they could see—but from which they were now vulnerable to our tanks and tank destroyers.

Another subject of frequent report from units in the European Theater was joint tactics of infantry and armor in town and village fighting. Here are some highlights, the source being indicated after each.

"Our practice is to let the infantry enter the town while the tanks move to the flanks and rear to destroy the enemy as we flush him out. When the town is captured, the tanks move immediately to the outskirts to provide protection until the tank destroyers come up."

—116th Infantry.

"For each infantry platoon, we provide two tanks in support and two in reserve when moving through a town. The leading tanks are relieved by the reserve tanks when about half of their ammunition is exhausted. They take position in reserve and refill when the opportunity offers. In this way, continuous support is provided and all tanks are available for an emergency when any emergency is likely."—736th Tank Battalion.

"We assign one tank to fire on the lower floors and one on the upper stories. They fire on prearranged signals from the infantry."—377th Infantry.

"Where streets are wide enough, we have two tanks move abreast, each firing on the opposite side of the street. With this method, the tanks do not have a blind side as when they operate singly."—48th Tank Battalion.

"Our tanks start firing at the lower floor and work up. This either forces the enemy into the basement where the infantry can trap him, or drives him progressively up until our fire catches him."—750th Tank Battalion.

"When it is necessary for our tanks to work one to a street, we assign four infantrymen to protect each tank against short range antitank fire."—26th Infantry.

In the Pacific there were repeated instances of taking tanks where they "couldn't go" with astonishing results. Here is a quotation from the commanding officer of the 13th Armored Group on Luzon:

"In difficult country it took tremendous effort to get tanks up the steep slopes to the Japanese defensive positions. But the effort was well worth while. Often even one tank was of powerful assistance, partly because of the surprise. We also found that usually the Japs had prepared no antitank defenses in such locations."

By the close of the European campaign many units had adopted a fairly complete SOP for joint operations of infantry and armor. There are some noteworthy features in this extract from a report by the 612th TD Battalion.

"Before bringing forward the tank destroyers, the infantry would clear the mines on the route, prepare defensive positions, usually using shell or bomb craters as the start, compute ranges and provide guides. Our movement into position was screened by smoke. When the tank destroyers opened fire, the infantry mortars also opened with high explosive for the double purpose of confusing the enemy and keeping him down. When our mission was accomplished, our withdrawal also was screened by smoke."

Innumerable expedients were adopted. Most of them were made on the spur of the moment and many of them showed considerable ingenuity.

A number of units obtained forward observation for artillery fire from officers and noncommissioned officers of front-line tank units. The 229th Field Artillery Battalion made it a practice to place an artillery observer in one forward tank of each of the tank supporting elements.

Tanks were frequently used to bring forward supplies to the infantry where conditions made it impracticable to bring them forward by wheeled transportation.

In the 66th Armored Regiment a number of tanks were equipped with racks on the rear, permitting the evacuation of three wounded on each tank.

Beginning with the first joint operations in Normandy and continuing throughout the campaign, emergency supplies for the infantry were carried on the outside of the tanks fighting with them. This made the supplies readily available in combat, and tended to promote the feeling of comradeship and mutual confidence which grew amazingly during the campaign.

It will be noted that, in the examples given, solutions of the same problem were frequently widely divergent and, at times, almost diametrically opposed. At times they were in violation of what was our teaching. These are presented not with any idea of indorsing them as future doctrine, but rather with the idea of exemplifying the ingenuity and mental freedom of the American.

We, who bear the responsibility for the training of our basic fighting team of the future—infantry, armor, artillery and air—must do certain things.

Our training must keep abreast of new ideas.

We must study those ideas from every angle and try them in every way until we know what the effect will be—how best we can exploit their use.

We must foster and encourage in every possible way the spirit of comradeship and mutual confidence between these arms. To this end peacetime dispositions and training plans should insure that infantry tanks and armored reconnaissance units (and of course the always indispensable artillery) train together.

It is not the job of the infantryman or the tanker to worry yet about the effect of the atomic bomb on any future warfare, or about any of the other things that are hailed as presaging a revolution in combat methods. We must, rather, take our stand on the firm foundation that the infantry-tank team, reinforced by the powerful assistance of air and artillery, is the most potent fighting combination that ground combat has yet known.

Our job is to increase the power of this combination to the limit.

Above all, we must encourage and develop that quality in the American soldier which is a part of and peculiar to our way of life, the independent and challenging spirit which accepts nothing as final but always poses the question "Is there a better way to do it?"

* * *

Signal Equipment and the Armored Forces

by Major General H. C. Ingles
Chief Signal Officer

THE use of radio equipment in armored vehicles during World War I was not extensive compared with modern standards. Radio and automotive armored vehicles were relatively new and there was no working background to form a basis for their coördinated use.

As a rule, small field radio sets were mounted in the vehicles and operated on frequencies which embraced the present commercial broadcast band, and a few hundred kilocycles above it. These frequencies were strongly affected by man-made interference and by atmospheric electricity.

Comparatively little was known about antenna requirements in those days, and the range of vehicular radio was curtailed since the short antennas used could not function efficiently on the relatively long wave lengths (medium frequencies) then in use.

It was almost a decade after the war before appreciable progress was made in designing radio equipment for use in armored vehicles, rather than merely adapting existing equipment to such use. Within two more years, a tank set had been developed and tested in the 3,000 to 4,800 kilocycle band. Reception was good on CW, ICW and voice over a range of three-quarters of a mile.

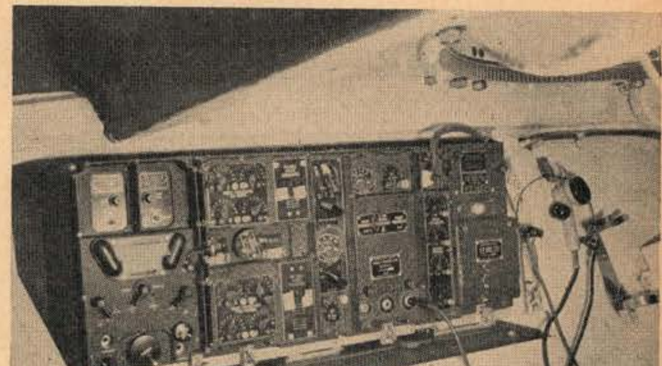
Shortly after this country's entry into World War II, this range had been increased more than 3,000 per cent.

Supplying communications equipment for armored force vehicles presented a number of problems not encountered, or met only to a lesser degree, in designing other signal corps apparatus.

Space was restricted and the equipment had to be compact. The vehicles were highly mobile; it therefore was necessary that the equipment be capable of functioning whether or not the vehicle was in motion as well as affording communication range over appreciable distances. The vehicles traveled over rough terrain—some were amphibious; the equipment had to be engineered to withstand violent road shock, and shock mountings were needed. The vehicles were used in all theaters and the communications equipment had to perform in the zero temperatures of the sub-arctic and in the heat and humidity of the tropics. Vehicles were made in a wide variety of types, necessitating various means of mounting radio sets and their components.

In addition, antennas were required to fit the conformation of the vehicles and to match the input and output impedances of the receivers and transmitters. As armored vehicles are sources of both electrical and mechanical noise, it was necessary to devise means of avoiding or minimizing the effects of electrical noise through the use of suppression systems and set design, and new microphones and headsets were developed to overcome difficulties caused by mechanical noise.

The radio set SCR-506 as installed in the right hull bulge in the light armored car, M8. This photograph was taken from the driver's position.



Signal Corps Photo

The first development work on a radio set designed especially for use in armored vehicles was the conversion of the transmitter of a radio set formerly used in day bombers (the SCR-134) to vehicular installation. For use in tanks, this transmitter was combined with the receiver from a cavalry pack set, the SCR-163. The latter provided 10-mile phone and 30-mile CW range. These equipments gradually evolved into the Radio Set SCR-193 which was in use during the early months of World War II.

As early as 1930, tests were made with equipment which incorporated an interphone to permit communications between members of the tank crew under the conditions of high mechanical noise encountered within tanks. An "antinoise" microphone—the early forerunner of the noise-cancelling lip microphone T-45—was found to afford much better communication than standard radio-telephone microphones.

Antennas had posed a problem from the very first. It was necessary to establish a compromise between mechanical strength and suitable electrical characteristics. Many types were considered: a condenser (capacity) type consisting of a metal plate supported several inches from the tank hull, a piece of heavy pipe bolted to the top and rear of the tank, a trailing antenna, and a loop antenna mounted on the tail of the tank. However, despite the likelihood of damage from overhanging branches, enemy fire and other hazards, the conventional fish-pole antenna was soon found to be the most practical. It was developed in 1930 and, with many improvements, has remained in use ever since.

Tests were conducted in 1931, using the then standard ground set, SCR-136, the two-pack set, SCR-163, and a newer set—SCR-189—which had been developed especially for tank use. In addition there was a receiver for installation in tanks which might be "dumb" but not "deaf," the SCR-190. Each of these sets was powered, at least in part, by batteries external to the electrical system of the vehicle.

Later developments were Radio Sets SCR-209 (a transmitter and receiver) and SCR-210 (receiver only). These formed the groundwork for the development in 1936, of Radio Set SCR-245, one of the best-liked armored force sets in the early years of the war.

In these early days, armor was known as mechanized cavalry. As it assumed greater importance, becoming the armored forces, the necessity of providing improved radio equipment became manifest. In 1940, a program for the provision of special sets was undertaken to meet military characteristics supplied by the Armored Force Board. These characteristics resulted finally in the production of Radio Sets SCR-506, SCR-508, SCR-509, SCR-510, SCR-528, SCR-538, and such accessory equipments as Interphone Equipment RC-99 and Interphone Extension Kit RC-298.

Radio Set SCR-506 is used for communication in command and administrative radio nets. It uses amplitude modulation, the transmitter providing 126 channels from 2.0 to 4.5 mc, and the receiver covering 2.0 to 6.0 mc. It was available for use with either a 12-volt or 24-volt power supply, and was designed for installation in various tanks, armored cars, half-tracks and other vehicles, either alone or in combination with other vehicular sets.

Radio sets SCR-508, SCR-528 and SCR-538 are similarly designed for operation on 12 or 24 volts, and for a wide range of installations in armored or other vehicles. The SCR-508 includes two Radio Receivers BC-603, and one Radio Transmitter BC-604 (which incorporates an interphone amplifier). SCR-528 is the same, except that only one radio receiver is included. SCR-539 has one receiver and no transmitter, the interphone requirements being provided by Interphone Amplifier BC-605. These sets, providing 80-channels in the 20.0 to 27.9 mc band, are of the frequency modulated type, affording voice communication over a 10-mile radius when moving or a 15-mile radius when stationary, even in areas where the electrical noise level is high.

Radio Sets SCR-509 and SCR-510 are also frequency modulated equipments; the former is a portable set powered by dry cell batteries, the latter a similar vehicular set operating from a 6-, 12-, or 24-volt dc source. Each transmits on two pre-set channels in the same band as the SCR-508/528/538 series, affording a five-mile range with voice communication.

As none of these sets netted with infantry equipment, two other radio sets were employed to facilitate tank-infantry cooperation. Upon occasion, Radio Set SCR-536 (the "handie-talkie") was taken into the tank, for communication between the armor and the infantry which supported, or was supported by it. The SCR-300 (the "walkie-talkie") was similarly used, and formed the basis for a new equipment: Radio Set AN/VRC-3. This set included the Transmitter-Receiver BC-1000 of the SCR-300, with a special antenna, tower supply, and other accessories to suit it to vehicular use. Like the SCR-300, the AN/VRC-3 was frequency modulated, with a range of three miles on voice in the 40.0 to 48.0 mc band.

To permit conversation between the members of the crews of tanks and other armored vehicles, Interphone Equipment RC-99 was provided. This was employed in conjunction with radio sets that did not include interphone, and in vehicles not radio-equipped.

Interphone Extension Kit RC-298 was used to afford telephonic communication from persons outside the tank to those inside. It consisted essentially of a handset mounted in a metal box on the tail of the tank and connected to the interphone system of the tank. When the tank was halted, or moving slowly, persons external to the tank were able to take the handset and talk to the crew. When tanks were emplaced, a remote field Telephone EE-8 could be connected to terminals provided in the external box.

Although the frequency modulated radio equipment designed for the armored forces was relatively free from the electrical interference created by the vehicles, further measures were taken to minimize this noise as much as possible. Not only were the sets carefully shielded, but the ignition systems of the vehicles were shielded and (or) suppressed. It was found that wheel and track static might be minimized by the employment of conductive rubber for tank treads and the like. These measures, together with bonding to keep all portions of the vehicle at the same potential, kept such interference at a minimum.

Mechanical noise was overcome by means of specially designed microphones and headsets. Microphone T-45 incorporated a diaphragm, both faces of which were exposed to ambient noise, striking both faces simultaneously, little or no diaphragm motion was caused by the noise sound waves. As the microphone was suspended on the upper lip of the user, his voice struck one face with far more force than the other, thus providing a signal.

Mechanical noise was prevented from interfering excessively with reception through the use of Headset H-16/U. This consisted of a pair of large ear cups, made of soft rubber where they contacted the wearer's head, and of steel on the outside to afford protection. In the base of each cup was a matching transformer and a phone unit of the hearing aid type, the output of which was fed to the user's ear through a metal tube and a soft rubber ear insert. The double seal (insert to ear orifice, and cup to head) cut out a large percentage of the ambient mechanical noise.

In addition to radio communication equipment, the armored forces were provided with cloth panels for use in identifying themselves to friendly aircraft in the daytime, and high intensity signal lamps for a similar function at night.

The armored forces' use of signal equipment was by no means limited to the items especially designed for them, for higher echelons employed all the wire, high power radio, radio relay, teletype and similar systems which were used by similar commands. The extent to which such equipment served can be judged from the records of the 146th Armored Signal Company, which served with the 6th Armored Division from Normandy through Brest and the Battle of the Bulge, all the way to the Mittweida, in Germany.

During the period from July 18, 1944, to May 8, 1945, the message center of this company handled 152,340 messages, of which about one-fourth were forward and three-fourths to the rear. It is estimated that 14 ¼-ton vehicles traveled a total of 208,544 miles to accomplish this.

Some 1,385 miles of telephone wire were laid during this period, and 3,508 teletype messages were handled. Six CW radio nets operated with net control stations located at division headquarters, including one station always in the Corps' Command net. From July 27, 1944, to May 8, 1945, these stations transmitted a total of 3,414 messages, representing 117,594 groups. It has been estimated that approximately six times as many messages were received as were transmitted. These figures do not include some 20 other CW radio nets operating within the units of the division.

The signal corps equipment supplied to this single armored signal company during the July 18, 1944-May 8, 1945, period included:

Antennas	292	Radio Set SCR-300	26
Batteries	88,894	SCR-506	18
Converter M-209	82	SCR-508	56
Cords	2,413	SCR-509	4
Crystals, sets	150	SCR-510	220
Dynamotors	84	SCR-511	21
Flashlights	2,789	SCR-528	51
Fuses	490	SCR-536	137
Handsets	260	SCR-538	10
Headsets	906	SCR-593	10
Mast bases	467	SCR-608	7
Mast Sections	4,944	SCR-610	13
Microphones	1,182	SCR-694	19
Mountings	75	Radio Receivers	100
Panel Sets	6,045	Transmitters	105
Telephone EE-8	577	Tubes	17,631
Wire, miles	6,162	Detector Set SCR-625	—

The above figures do not include radio sets drawn through ordnance channels with replacement vehicles, nor the individual items on the parts lists of complete radio sets.

The performance of the equipment supplied to the armored forces by the signal corps may best be appreciated by a study of the reports from using organizations. The following are typical:

"Armored force Sets SCR-508, 528, 538 and SCR-509 and 510 have become the backbone of communication within the armored division. The inherent advantages of FM (frequency modulation) in overcoming static and ignition interference and in giving a clear voice signal of sufficient quality and volume to be heard over the noise of tank operation, have fully justified the additional complications of design and manufacture. The flexibility of operation, combined with the accuracy of crystal control, have made this series of sets the easiest sets there are to operate."—Letter from Colonel Grant A. Williams to Office of the Chief Signal Officer, March 18, 1944.

"Lt. Col. Wyndham, Signal Officer, First British Armored Division, said of the SCR-508, 'I like it. It's better than anything we have. I like its compactness.' "

"The Facsimile Equipment RC-58 is one of the most valuable improvements received to date. We have 15 sets operating continuously, and no real difficulties have been encountered once the equipment was installed." —Lieutenant Colonel H. C. Williams (with 1st Armored Division), December 29, 1944.

Perhaps it would be well to conclude this article with an extract from the report of the 141st Armored Signal Company from June 18, 1940, to May 20, 1943:

"All radios were working excellently and communications were the finest to be had."

Combat Engineering--
Lingayen to Manila*

by

Lieutenant Colonel James B. Lampert

Corps of Engineers

THE XIV Corps of the Sixth U. S. Army landed on northwestern Luzon in the Philippines on January 9, 1945, then marched and fought its way 120 miles to enter Manila in 26 days, and had cleared the city of Japanese by March 3. As in every other operation of the war, Combat Engineers were there all the way.

The Sixth Army made its landing with the I and XIV Corps on Lingayen Gulf. Its mission was to seize a beachhead in the Lingayen—Damortis—San Fernando (La Union) areas, and subsequently seize the Central Plains—Manila area by overland operations. Each Corps consisted of two divisions and supporting troops. A fifth division was in reserve. Lt. Gen. O. W. Griswold's XIV Corps, composed of the 37th and 40th Infantry Divisions, landed on the beach between the towns of Lingayen and Binmaley.

Operation In Three Phases

I Corps, on the left, encountered stiff resistance, and was forced into a hard, slow advance into the mountains and hills to the east and north. XIV Corps landed almost unopposed, and exploited its landing with vigor. The result was an operation in three phases:

a. A speedy, relatively easy, advance over open terrain to the Fort Stotsenburg Area, where stiff resistance in the hills on the west was cleaned out by the 40th Division only after bitter fighting lasting several weeks.

b. A sidestepping by the remainder of the Corps around Stotsenburg, and a resumption of the drive into the outskirts of Manila, over numerous streams where all bridges had been destroyed and against constantly increasing resistance. The newly arrived 1st Cavalry Division joined the Corps in this phase and formed the left of the two-pronged advance.

c. A month of bitter fighting through the streets and from house-to-house to clear Manila of last-ditch enemy resistance which caused high casualties among our troops. In this phase the Corps was reinforced by the 11th Airborne Division, under control of Eighth Army, which had landed near Nasugbu, south of Manila Bay and forced a rapid entrance into Manila from the south.

Combat engineer missions in the first two phases were almost exclusively stream crossings. The third phase brought the Corps into heavily mined and barricaded areas, and the engineer troops put much of their effort on these. Engineers of the 4th Special Brigade operated the corps beaches at Lingayen. Army engineers, including aviation battalions, often were near the front, both in support of the tactical mission and on high priority logistical projects requiring early completion. This article covers only operations of engineers under XIV Corps, omitting the fine record of these other units.

Plans for the Landing

Local planning for the Lingayen landings began in August of 1944. The Corps Engineer was a member of a planning party under the Chief of Staff, XIV Corps, which spent about a month at GHQ in Brisbane. Final planning was conducted and completed at the Corps C.P. at Bougainville, Solomon Islands. The 37th Division and the bulk of the corps troops were at Bougainville; the 40th Division was at Cape Gloucester, New Britain.

Extensive terrain studies, aerial photographs, and maps of the beach area were available to the Corps Engineer. Two considerations governed engineer planning:

a. The XIV Corps landing beach was backed by a delta area crisscrossed by streams, estuaries, fish ponds, and rice paddies. The most important stream was the Colmay River. In effect the initial landing area was an island, and several successive stream crossings had to be made to debouch from it into the higher terrain of the northern Central Plains. The only safe tactical assumption was that all bridges would be destroyed by the enemy. (See Figure 1.)

b. Only two main roads led south in the corps sector. Assignment of one road to each division as a main supply road was obviously the only solution for the planned advance toward Manila.

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*The Military Engineer.

The restricted amount of usable land in the delta area, and the extensive plans for early landing of troops and supplies, as well as for immediate development by Army of the Lingayen Airfield, required that the tactical troops clear the area and seize terrain to the south, without delay, to give themselves "room to fight."

Based on these considerations, plans were adopted for division and corps engineers to land by means of assault shipping enough bridging material to open the two axial roads for required loads without dependence on material from other sources. By a compromise between the desired and the available, the final plans provided this bridging composed of prefabricated timber trestle, three units of Bailey bridge, and the M-3 material of the light ponton company. Sixth Army promised additional bridging on Army-controlled ships to follow immediately.

Less concern existed over the engineer problem south of the Colmay Delta. This stage of the campaign could develop along any of several different lines, and detailed planning had to await development. Supply of materials after the assault stage was an Army responsibility.

Intelligence data indicated few underwater and beach obstacles, and the landing plans assigned to the Navy the primary task of removing any which might be found. Engineer demolition parties were organized, and accompanied the advance waves to reinforce the naval parties, if required, but prelanding reconnaissance confirmed our information. No obstacles were encountered.

Engineer troops assigned to the Corps were the 1129th Combat Group, 131st Combat Battalion, 1279th Combat Battalion, and five separate companies: topographic, maintenance, light ponton, water supply, and camouflage. The group headquarters and two battalions had been with XIV Corps through the New Georgia and Bougainville operations. In a theater accustomed to a paucity of engineers, this troop list was almost utopian.

The engineers on Bougainville were relieved from operational duties just prior to departure for Luzon, but they managed to sandwich in some good training, obtained full replacements, and were in good order when the loading-out time came. One weakness was that none of these units, long overseas, had seen a Bailey bridge until late November. Later results showed up this weakness.

Engineer supply before the operation posed two main jobs: replacing old equipment and finding enough bridging. The equipment arrived, but every commander and supply officer aged ten years trying to get it. Bridging was provided by working every possible source. When bridge timber imports failed to materialize, engineer sawmills on Bougainville milled enough native timber for 1,500 lineal feet of 35-ton trestle bridge; this, late, was worth its weight in paper pesos. To complicate the supply picture, Bougainville having been part of the South Pacific Command, the troops coming from there drew their supplies from that command; the troops at Cape Gloucester drew on Southwest Pacific supply bases.

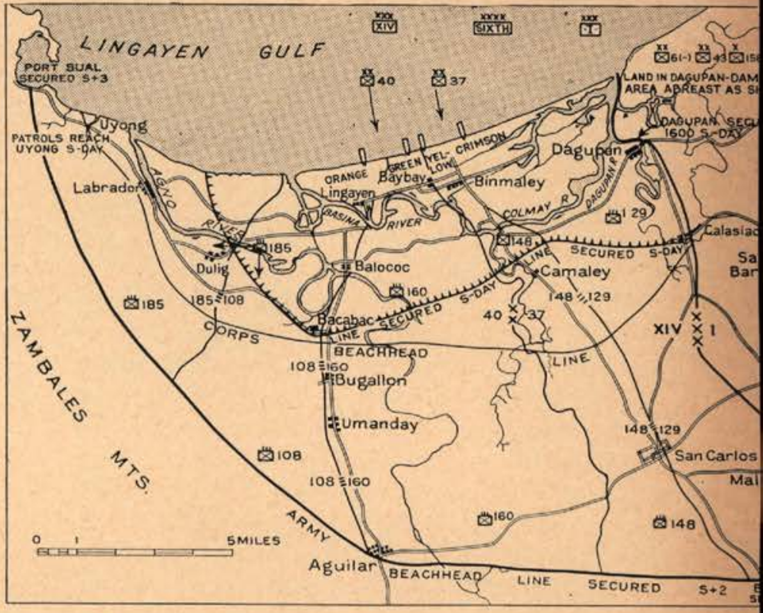


Figure 1. XIV Corps landing operations.

As in all amphibious operations, the provided ships lacked the capacity to carry all the matériel on hand. Engineer equipment was given preferential treatment to meet the anticipated problem of egress from the Colmay River delta at Lingayen, but equipment and supplies whose lack was sorely felt were dropped back to later shipping echelons. The 1279th Combat Battalion moved by administrative shipping from Bougainville to Cape Gloucester in November, and there was attached to the 40th Division for the voyage north. What could not be squeezed into the ships was left in rear echelons at Bougainville and Cape Gloucester, and shipped to Luzon during the succeeding five months. XIV Corps shipping left Bougainville and Cape Gloucester in December, rendezvoused off Huon Gulf, New Guinea, and moved north via Manus in the Admiralty Islands.

The Advance

Both divisions advanced rapidly after the assault waves reached the beach. In the 37th Division sector, the 117th Engineers of the Division came ashore attached to regimental combat teams and reverted to battalion control on S-Day plus 2. Using mobile-loaded bridge timbers, they bridged two small streams between the beach and the Colmay River. Infantry crossed the Colmay on S-Day in amphibious tractors and LCMs which came upstream from the sea. The highway bridge near Binmaley, a Howe-type steel truss, with one span dropped into the river, comprised the first obacle. The 117th Engineers laid a plank treadway to pass jeeps over the top chord members of the dropped span, and followed this with a 120-foot double-double

Bailey bridge. Heavy surf at the beaches delayed unloading, and construction of the bridge was slowed until enough Bailey parts came ashore and were hauled to the bridge site. The 131st Engineer Battalion, which had landed with the 37th Division beginning on S-Day completed the bridge.

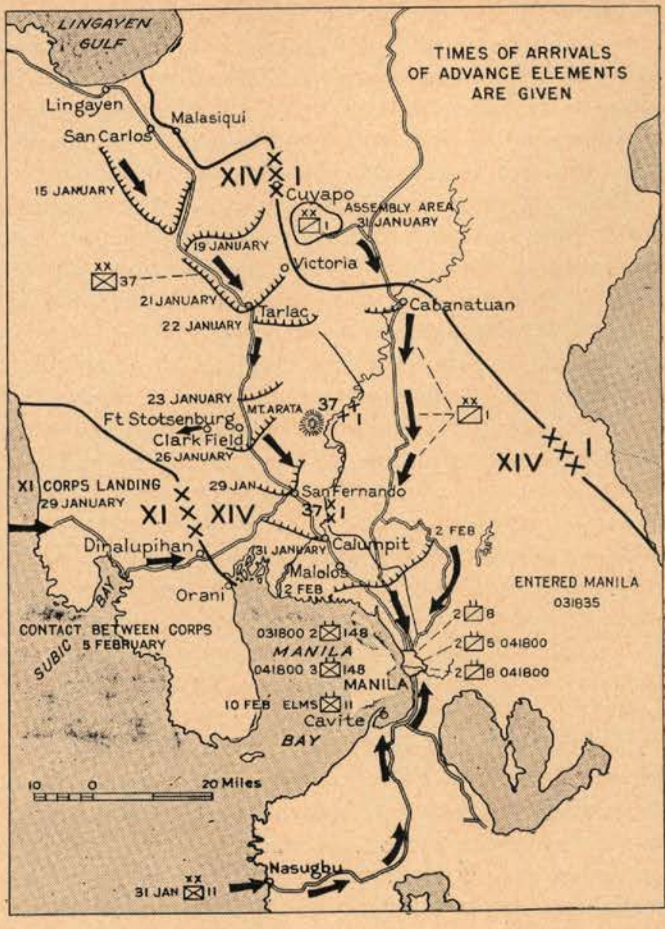
Four miles farther south toward San Carlos, no additional floating or Bailey bridging having yet come ashore, the 117th Engineers constructed a 120-foot timber trestle bridge over a tidal stream with a soft bottom, in thirty hours. This bridge passed twenty-one medium tanks in two hours, plus the bulk of the traffic of division headquarters and one RCT, before the bents, as expected, began to settle unevenly. The 131st Engineers by this time had procured more Bailey material at the beach and launched a Bailey bridge over the trestle structure, which adequately carried all remaining loads.

Another RCT advanced south on the parallel road Dagupan—Malasiqui, supported by a company of the 117th Engineers. Several small streams were crossed by a variety of measures. Destroyed bridges were repaired by pioneer methods, one ferry was installed using pneumatic floats and bridge timber brought ashore by the division engineers on S-Day, and on occasions Filipinos built footbridges of bamboo, lashed together with grass.

The 40th Division, moving south and west from Lingayen, was faced at once by two large streams, the Basina and the Agno. Assault troops went over in LCMs, Amphtracs, assault boats, Filipino dugout canoes, and Infantry support rafts. Both streams were deep, tidal, and over 500 feet wide. Permanent bridges had been destroyed twice, by the retreating Americans in 1941 and again by the Japanese in 1945. Floating bridge equipage did not become available until S plus 4. At that time the 556th Heavy Ponton Battalion (a newly arrived Sixth Army unit) threw a steel treadway bridge over the Basina, and the 530th Light Ponton Company under the 1129th Group installed an M3 Light ponton bridge over the Agno. The road was opened to division loads on S plus 7.

The Group Commander had placed the 1279th Combat Battalion in support of the 40th Division. This unit landed on S plus 2 and thereafter worked in close liaison with the Division Engineer, Commanding Officer of the 115th Engineers.

South of the line Aguilar—San Carlos—Malasiqui, the terrain is rolling, relatively high, and cut by small streams. The divisions drove south on parallel roads to the Clark Field—Fort Stotsenburg area (see Figure 2), and engineer support followed a definite pattern. Division engineers built hasty by-passes around destroyed bridges by bulldozing earth fills across streams, using wooden culverts or short trestle bridge sections on the larger streams. The corps battalions followed closely behind, taking over each project from the division engineers as rapidly as possible, completing and improving it for corps loads, and then, in turn, handing it over to Army engineer units in the rear. This system could have succeeded only in the dry seasons, when all watercourses were at lowest stages. Two crossings of the Agno in the 37th Division Sector were made by heavy ponton bridges constructed by the 556th Heavy Ponton Battalion.


LINGAYEN GULF
TIMES OF ARRIVALS OF ADVANCE ELEMENTS ARE GIVEN
Lingayen
Malasiqui
San Carlos
15 JANUARY
XIV XX I
Cuyapo
ASSEMBLY AREA 31 JANUARY
19 JANUARY
Victoria
37
21 JANUARY
Tarlac
22 JANUARY
Cabanatuan
23 JANUARY
MT ARATA
37
Ft Stotsenburg
Clark Field
26 JANUARY
XIV XX I
XI CORPS LANDING 29 JANUARY
29 JAN
San Fernando
XI XIV
37
2 FEB
Dinalupihan
31 JANUARY
Calumpit
Malolos
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Orani
ENTERED MANILA 031835
2 8
CONTACT BETWEEN CORPS 5 FEBRUARY
SUBIC BAY
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MANILA
041800 3 148
2 5 041800
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10 FEB ELMS 11
Cavite
BAY
10 0 20 Miles
Nasugbu
31 JAN 11

Figure 2. Routes of advance to Manila.

In the Clark Field—Fort Stotsenburg area our troops encountered the enemy in force. The 40th Division swung to the east to clear the area and the surrounding Zambales foothills. The result was a tedious drive into a rugged, heavily fortified area where advance was measured by the number of cave defenses knocked out. The 115th Engineers found their load lightened with the slower advance. They were employed mainly on construction of temporary "jeep" supply roads into the foothills, and on removal of minefields. Meanwhile the Corps, now strengthened with the 1st Cavalry Division, pushed on to Manila.

DRIVE TO MANILA

The 1st Cavalry Division, attacking south from the Cabanatuan area along Highway 5, made its now-famous dash into Manila. By speed and by skillful use of sideroads and fords, its advance elements brushed aside scattered opposition and reached Manila without being delayed by destroyed bridges. The 8th Engineer

Squadron of the Division sent mobile-loaded bulldozers and bridge timber with the leading elements, and provided an adequate crossing or detour at every stream. The 131st Engineers, less one company, were placed in support of the division on January 29, and, to quote the battalion commander, "spent most of their time trying to keep up." The route was over good roads, and the seizure of a large number of bridges before the Japs could destroy them eased the engineer task.

The 37th Division, and the bulk of the corps troops moved on Manila via San Fernando, along Highway 3, designated the corps axial road. Here also a rapid advance brought about the capture intact of several bridges south of San Fernando. However, American strategic bombing in the preceding months had destroyed the bridges on three major streams near Calumpit, of widths ranging from 250 feet up to 600 feet. Assault troops crossed these streams in amphtracs, assault boats, and on light ponton rafts. Heavier traffic, including vitally needed artillery and tanks, was stalled.

This nut was the hardest to crack of any between Lingayen and Manila. New floating equipage on ships anchored off the Lingayen beaches was delayed in coming ashore by unloading priorities. The advance had left the engineer dumps far behind. Much of the equipage already on shore was installed over streams to the rear. The nut cracked by working on every possible solution. The Army, Corps and Division Engineers maintained almost continuous telephone connections among all their offices. At Lingayen, a cargo of treadway bridge was unloaded at once. The 556th Heavy Ponton Battalion (Sixth Army) bridged the 250-foot stream at Calumpit with a 25-ton ponton bridge and the 600-foot Pampanga River was spanned with a M2 steel treadway bridge. The 1279th Engineers replaced three demolished spans in the third bridge with 80-, 90- and 100-foot Bailey spans. The S-4 section of the 1129th Group pooled all available cargo trucks and ran a continuous motor-freight service, hauling bridge material 80 miles from the Lingayen beach dumps direct to the sites. Initially the treadway material was insufficient to bridge the Pampanga; the 530th Light Ponton Company finished the job with M3 light ponton equipage, successfully improvising a floating joint between the two types of bridge. Three combat companies from the 131st and 1279th Engineers reinforced the ponton units for the work. And no one in the division and corps engineers went to bed for 72 hours. The bridges were open on the third day.

Japs Destroy All Bridges

Meanwhile the 37th Division continued on to Manila. In the final 30 miles were six or seven streams, averaging 150 feet wide. Capitalizing on the delay near Calumpit, the Japanese had destroyed all of the bridges. From February 3-6, the 530th Light Ponton Company was in close support of the 37th Division. Its light equipage bridged or provided ferries across each stream. One critical day all the 105mm howitzers of the division successfully crossed two streams on infantry support bridges, whose rated capacity is only a 2½-ton truck. M3 light ponton equipment was used on two streams. As before, the corps combat battalions, supported by Army heavy ponton units, followed the advance elements. Bailey bridge, hauled by truck from the Lingayen area, was used wherever it was possible; steel treadway was thrown across two sites. By evening of February 7, all traffic was moving directly into northern Manila. In seven days, using material transported an average of 100 miles, a light ponton company, two heavy ponton companies, and the equivalent of five combat companies drawn from three battalions had constructed 2,100 feet of 35-ton floating and Bailey bridge.

During the month ending with the drive into Manila, perhaps 80 per cent of all combat engineer effort was spent on getting the divisions over streams. Other tasks, of course, were continuous. One Corps combat engineer company landed on S-Day, with three bulldozers, and helped construct positions for the antiaircraft artillery with the Corps. This attachment was terminated after four days, when our overwhelming air superiority and movement of the Corps south from the beach supply areas indicated the improbability thereafter of serious enemy air attacks.

Road maintenance by corps engineers was secondary. The rate of advance prevented anything but filling pot holes and hasty grading. Dry weather was on our side, and the comparatively good network of prewar highways carried all corps loads without any failures. What had been a major problem for engineers in the rains of the Leyte campaign was a comparatively routine task on Luzon.

Our drive met the first obstacles in the Clark Field area, mostly crudely placed fields of hastily buried aerial bombs, plus some improvised wooden box and "yardstick" mines. Engineers of both divisions and from the two corps combat battalions, materially assisted by ordnance bomb disposal teams, cleared these fields. Detection was easy because of poor concealment.

Engineers were not used as infantry but they habitually provided security for their own work parties.

The separate engineer companies with the Corps worked with distinction at their assigned jobs. The work of the light ponton company has been discussed. The 1520th Water Supply Company, two platoons landing S-Day, established water points in close support of the two divisions, and moved often to keep its supply sources well forward. The survey platoon of the 670th Topographic Company was attached to the Corps Artillery, which had no organic artillery survey elements. They continued this mission throughout the campaign. The balance of the company, landing on S-Day plus two, remained mobile until the advance passed Tarlac. It then established itself in that town and printed maps and map substitutes round-the-clock for XIV Corps and Sixth Army.

CAPTURE OF MANILA

The flames of burning Manila lighted the sky every night of the week before we drove into the city. The awful destruction, the bitter Japanese stand in the most modern part of the city until the beautiful government buildings and the historic Intramuras were battered down on the last enemy, are familiar stories now. The engineer share in the capture of Manila was two-fold: crossing the Pasig River and clearing the heavily mined streets.

That half of Manila north of the Pasig was captured quickly. On February 6, the 37th and 1st Cavalry Divisions stood all along the northern bank. The 11th Airborne Division entering southern Manila after its rapidly exploited landing south of Manila Bay, passed to XIV Corps control on February 10. To cut off enemy escape to the east, and clear the city, the three divisions were ordered to converge on the main enemy force in the modern business and government district south of the Pasig.

The 148th Infantry (37th Division) crossed the Pasig on February 7 near the Presidential Palace, in 30 assault boats manned by the men of the 117th Engineers. Five waves were crossed, all but the first under intense enemy small-arms, mortar, and medium artillery fire. Infantry support rafts propelled by outboard motors, followed up and supplemented the assault boat crossing. The following day, the 530th Engineers moved their M3 equipage to the area, and, after several delays because of hostile fire, threw across a 350-foot bridge in seven hours, completing it at midnight. This bridge site was under fire for several days, but constant maintenance kept it open, and it supplied the 37th Division advance for three days. Army engineers, procuring equipage as fast as it came ashore at Lingayen, constructed an M3 steel treadway bridge with the assistance of the 1279th Engineers, which eased the traffic load.

Two miles upstream, on February 9, the 8th Engineers ferried assault waves of the 8th Cavalry across the Pasig against light opposition, and maintained ferries for two days until completion of a 260-foot M3 steel treadway bridge by the 556th Heavy Ponton Battalion, assisted by the 1279th Engineers.

In the final assault on the Intramuras (walled city) on February 23, one of the three simultaneous attacks was an assault crossing of the Pasig by the 129th Infantry (37th Division) in assault boats manned by the 117th and 530th Engineers. Thanks to the artillery preparation and the vigorous land attacks on two other sides of the Intramuras, this crossing was completed without opposition.

The enemy subjected the Pasig bridges to intermittent fire for two weeks. Several hits occurred, but repairs were always completed without serious delays. Japanese suicide demolition detachments twice approached bridges at night in small boats. Each time they were fired on by the bridge guards, their demolition cargoes detonated, and the parties were effectively destroyed.

JAPS USE EXPEDIENT MINES

Minefields, infrequently encountered in outlying sections of Manila, were the major hazard in the Luneta-Intramuras Districts. For reasons not entirely clear, the Japanese continued to use only expedient mines—the most common being aerial bombs and marine anti-boat mines. Some were wired for electrical detonation from foxholes but, primarily because of our artillery preparations, no casualties resulted from deliberate detonation. Since most of these mines had been placed by digging holes in paved streets, detection was not difficult.

Minefield removal was largely the work of the 117th Engineers (37th Division) and the 127th Airborne Engineers (11th Airborne Division). The weight of the individual mines prevented removal by hand. The common system was unscrewing the fuze and then lifting the mine by a cable or improvised crane on a truck, tank or other vehicle. Much of this work was done under fire. The 37th Division Engineers removed several fields in streets near the City Hall under small-arms and mortar fire, by the successful use of a tank-infantry-engineer party. While infantry covered the area, the engineers moved out into the street in the shelter of the advancing tank, which fired its cannon at visible targets. Arriving at the mine, one engineer ran around the tank, disarmed the mine, attached a tow cable, and ran back to shelter. Then the tank, while continuing its fire, pulled the mine out of the ground and away from the area.

The 117th Engineer official report, in a prime understatement, says this svstem, while producing very low casualties, "was very nerve-racking on the mine-removal personnel."

SUMMARY

Manila was cleared of the enemy on March 3. This article has touched only the high spots of the engineer story during these two months. Through it all, while the more spectacular tasks occupied the limelight, every engineer soldier drove himself without rest on the endless tasks which are always his. He supplied pure water to the liberated internees at Santo Tomas; he drove his bulldozer against the debris that blocked the streets of Manila; he built semi-permanent bridges replacing hasty by-passes; he probed captured areas for mines; he did all the jobs in the field manual, and others, too.

The Combat Engineer doctrine contained in our manuals and our school teachings is sound. The campaign proved that. It also proved, if it needed proof, that the American engineer soldier is tops—his technical ability, native ingenuity, endurance, and high personal courage make him a man with whom it is a privilege to serve.

ARDED

Why Jap Air Force Died[★]

by Lieutenant Commander Philip Gustafson, USNR

IN a last-minute frenzy to find something that would stop our B-29s from destroying her industries and keep our fleets away from her shores, Japan was feverishly pushing the development of jet-propulsion aircraft when Hirohito ran up the white flag. Considering their late start, our air intelligence found, the Japs had made amazing progress. Yet, however well it was planned, this hastily built equipment proved to have too many bugs. Given time, the Japs would have eliminated them. But time ran out.

The Japanese aeronautical holy of holies was a straggling collection of thin-walled stucco buildings with flaking green-brown camouflage paint, flimsy hangars, and shabby aircraft parked every which way, some of them down on their knees from American strafing. On the surface, it wasn't much, but this was partly because there was so much beneath the surface: In the solid limestone of the Yokosuka hills were shops, hangars, storage and living quarters—a whole experimental aircraft factory underground.

Inside the shops, however, were dirt and disorganization. Hand benches. Hand tools. The hammering out of little pieces. Scattered disorder. Everyone had apparently worked in his own little messiness. There was no apparent clear flow of manpower effort.

"This was one of the very things that licked them," said Lieut. George Hall, USNR, grizzled, untiring, and tart of humor, who with Ensign Jimmy Wisely, USNR, went ashore with the Marines on August 30, the day MacArthur put his wheels down at Atsuki. His intelligence unit, which included representatives of the U. S. Navy, Army, and the RAF, was still living in front-line conditions when I arrived, cooking their own food, washing their own clothes, and flailing at fleas that abounded in the enemy's naval barracks.

"To my mind, the Japs were beaten before the first atomic bomb hit Hiroshima," Hall told me. "Their industrial system had been all but destroyed by our B-29's, their transportation system was breaking down, and all initial materials had been cut off by our subs and naval aircraft—stocks of aviation gas were so pitifully low that they couldn't even operate their current models. In semi-desperation they turned to rocket and jet-propelled development and committed all their remaining aircraft—between 8,000 and 10,000, they said—to Kamikaze attacks on our fleet. The Japs were a third-rate nation playing out of their league and the suicidal emotional drive they were trying to inject into their people would not make up for their own shortcomings in modern science and production."

This was the air force that four years before had challenged up to the heavyweight championship of the East and taken on the British on the side. And during the dark days of '42 its plagues of Zeros had come close to holding it. Then how did the mighty fall so low?

Admiral Hidao Tada, Chief of the Naval Experiment Station at Yokosuka, said one of the main reasons was the delay in replacing the Zero-type fighter.

"The high command was lulled into a sense of false security by the early successes of this plane, while your air force, with the sting of early defeat, began building on your Hellcat," he explained. "It was the Grumman Hellcat that beat Japan. When our high command did decide to put in mass production a plane to compete with your F6F, it was too late. We ran into design and production troubles. Then material shortages. In the end, we couldn't get the new fighters out in quantity."

Commander Yukio Otsuki, one of the chief designers; Vice Admiral Misao Wada, Chief of the Air Service Bureau, the Japanese counterpart of our Bureau of Aeronautics; and Vice Admiral Munetaka Sakamaki, one of the Navy's chiefs of air operations, told me the same story. Some of them blamed the delay on the General Staff and some on the fliers in the field, who clung to the idea of maneuverability. Admiral Wada said he had offered plane designs three years before with better armor, self-sealing tanks, and firepower but he had been turned down.

The story of the belated fighter development, as gathered from these different sources and from the confiscated aircraft themselves, is this:

Finally convinced of the inadequacy of the Zero, the General Staff ordered its designer, the great Horikoshi, to produce out an up-to-date fighter. Horikoshi went to work on the Reppu (Strong Wind) which turned out to be a gentle breeze. The trouble came when the Jap engineers, cut off from the countries they had always copied, had to turn to and bring out engines of their own. This same shortage of creative engineering talent, incidentally, showed up in other fields and proved to be one of the basic factors in Japan's undoing.

The Homare engine was the white hope to power the Reppu but it ran into bugs and more bugs. The electrical system was a nest for some. The lubrication system bred others. All of the headaches added up to a year and a half's delay and during this time the designers turned to the 18-cylinder Kinsei. This 18-month delay was fatal. Otherwise, said Admiral Wada, the picture might have been different, for the new plane was more maneuverable than the Hellcat, had good protection and heavier guns.

While Horikoshi was sweating out the Reppu, Ka-

[★] *Popular Science.*

wanishi came forward with a proposal to make a land fighter out of the float plane, Rex. The offer accepted, this plane was developed into the George 11. It was a good plane except that its aerodynamic characteristics were bad and the modification problems presented more difficulties than the hard-pressed Japs had time to contend with. They settled on mass production of the George 21—1,000 a month—but they overestimated their manufacturers, considering the problems of dispersal and material shortage that were then arising. The Japs say that if they had had the George 21 six months sooner, they would have discarded their other planes even to the old faithful Betty, and concentrated on this fighter.

As it was, when we walked in on the Japs we found their Navy with two good first-line interceptors in production—the George 21 and the Jack 34. With another six months to work the bugs out of George's landing gear and Jack's supercharger, Jap engineers would have brought these planes to the point where they spelled trouble for us. But for any change in the outcome it would still have been necessary to get the fighters into mass production, train pilots, and provide good maintenance. They were a good two years too late.

When their reconnaissance and air-raid warning system broke down, the Japs were wild for something that could get up in the air fast enough to stop the Allied bombers which were making a shambles of the home islands. It was then that, in their desperation, they turned the heat on jet propulsion.

They had reached the test model stage in a B-29 interceptor called the Shusui, to be powered with a copy of the Walther used in the ME-163, the first German rocket plane.

In another development, a jet coupled with an internal combustion engine was used in a new suicide plane, the Baka 22. A four-cylinder Hatsukaze, inverted in-line, air-cooled engine drove a single-stage compressor to provide the power for these specially built Kamikaze planes, of which the Japs had close to 100 assemblies in construction.

Probably their most outstanding achievement had been in the development of an axial-flow, turbo-jet engine with which they planned to power a conventional-structure interceptor called the Kikka. The first test model of the Kikka had gone in the drink in August when the pilot pulled the throttle on takeoff instead of pouring on full power. The Japs were also planning to use this engine in a new suicider designated as the Baka 43, which had reached the mock-up stage.

Besides pushing jet propulsion in their frantic, last-minute defense effort the Japs were also converting bombers into night fighters and interceptors. They were modifying all possible planes to carry inclined fixed guns which were to shoot from the most favorable position, beneath and slightly to the rear of the intended victim. Every device the designers could dream up was being used to make up for the mistakes which had put the Japs so far behind us in fighter types that virtually their whole naval fleet had been lost.

One of these mistakes was the failure to set up a good pilot-training and rotation system along the lines of our own. Japanese flying admirals, asked to explain the failure of fighter squadrons to use teamwork tactics, always gave the same answer: "bad interplane communications," and "not enough good pilots." The Japs, after they lost most of their best fliers in the battles of Midway, Coral Sea, and the eastern Solomons, never did catch up. After each battle they used to have to pull back their first-run fliers for a sort of general retraining program.

Wartime aviation in Japan worked under a continuous handicap: lack of cooperation between the Army and the Navy. The two branches fought like cats and dogs. All development, purchasing, and production were carried on independently until the latter stages of the war. This resulted in duplication of equipment which a small country like Japan could ill afford when she was trying to crack the big leagues.

Poor organization also carried over into the individual services themselves. Both Army and Navy were tightly compartmented organizations where one home command knew little of what went on in the next region, much less in the field of operations. One reason was the almost pathological caution of the General Staff in matters of security, probably made necessary by its policy of keeping the facts of life from the people. But in the Jap Navy, this policy boomeranged. Officers of the rank of captain and below usually didn't get the battle news! Obviously the results were inefficiency and failure.

"I didn't know what happened in what you call the Marianas Turkey Shoot," Commander Otsuki told me. "How was I to design airplanes?"

This compartmentation policy was a direct cause of one of the gravest errors that the Japs made, the introduction of too many plane types, with which they overloaded their factories. Both Army and Navy had a way of adding new types to the point of utter confusion. One count toward the last showed something like 70 types on the books at once. For this mistaken policy, the flying officers of the Jap Navy concurred in blaming the General Staff for ordering out a new model whenever combat conditions changed.

And here, in the field of production, according to Soemu Toyoda, the Admiral King of the Jap Navy, was the seat of the whole trouble.

"It was a situation that we in the Japanese Navy realized even before the war," Admiral Toyoda explained. "Even then, in the United States, machinery did the work; in Japan it was men. With our dense population we did not change then for fear of unemployment. In the war we had to adopt machine production but we could not convert the nation quickly enough from its traditional hand labor. This was the basic cause for the failure of our war effort."

CARDED

Enemy Equipment Intelligence

by Colonel Paul N. Gillon*

THE rapid rate at which new weapons were developed during the war as well as the great disadvantage under which we entered it made acquisition of technical intelligence of the enemy's combat matériel, especially in the field of ordnance, vitally urgent. Steps were therefore taken very early in the war to secure, train, and place in the field, officers and enlisted men specifically charged with securing all possible technical intelligence on enemy ordnance. As the need arose, technical services other than ordnance organized similar groups and placed them in the field. The activities of these groups gained important information, and with their growth and augmentation it became increasingly apparent that the integration of all such activities was highly desirable. Accordingly, early in 1944, the Army Service Forces Enemy Equipment Intelligence Service Teams were initiated by General Somervell, then Chief of Army Service Forces. All technical services of the army were represented. The difficulties encountered were great, because there was no precedent for such an organization.

The team as eventually organized provided for 14 officers and 22 enlisted men. Personnel was assigned from the following technical services: Ordnance, Signal Corps, Chemical Warfare Service, Engineer Corps, Quartermaster Corps and Medical Corps.

The mission of ASFEEIST was the acquisition, examination and disposition of captured enemy matériel and related data. Its work made it possible to provide accurate and prompt knowledge of new developments, or new techniques in the use of enemy equipment to the various research, development, and design agencies within the technical services of the War Department, as well as to the appropriate staff agencies in both theaters of operation and the zone of the interior.

Headquarters were maintained at Oahu. Since the isolated campaigns of the Middle Pacific involved the taking of islands at great distances from Oahu, the team was organized into forward and rear echelons. The rear echelons were kept at a minimum, so that a carefully balanced team could accompany the assault troops.

ASFEEIST personnel did not arrive in the theater in time to send a balanced team on the Marianas operation; however, a few representatives of Ordnance, Signal and Medical services of the team were able to participate in the operation, or to visit the Marianas shortly thereafter. The results were extremely satisfying, and much Japanese matériel was obtained and evacuated.

The Leyte campaign was the first sizable Pacific operation in which the team participated. This operation provided the basis for the planning which was done for the subsequent Iwo Jima and Okinawa operations. A total of seven officers and 14 enlisted men participated in the ASFEEIST phases of the Leyte operation. The matériel captured here was shipped to the United States for examination and analysis.

After participating in the Leyte landings, ASFEEIST took part in the Iwo Jima operation, during which it collected and analyzed many items of enemy equipment that were of intelligence significance, particularly rockets, other ordnance and signal matériel.

The final campaign of ASFEEIST was the Okinawa operation, where sizable quantities of matériel were recovered for shipment. One of the most significant contributions of the organization on Okinawa was its conduct of field tests on Japanese demolition matériel and the Japanese 47mm antitank gun.

The primary function of ASFEEIST involved the collection and dissemination, not only of Japanese equipment, but also of information regarding such equipment. The contribution made by ASFEEIST to the training program of American troops should not be overlooked, however. Many reports for this phase were written in the field very close to the point of capture of matériel. Technical analyses of important Japanese items of equipment were prepared by both its forward and rear echelons. Also, numerous items captured in forward areas were returned to the interested services in the United States for analysis in the army's laboratories. Wherever two or more items were found, one was shipped to the mainland and one retained for analysis by ASFEEIST personnel. Further work, such as metallurgical examination, was carried out in the great laboratories of America's universities.

The two functions of analysis of matériel and the training of troops concerning the matériel are complementary and consequently as the war progressed, the activities of ASFEEIST relative to the training phase increased considerably. All items of equipment not urgently needed for technical examinations were utilized first for training within the theater and second for training purposes within the United States. Large quantities were shipped back to the mainland for the latter purpose. The training of troops within the theater relative to enemy equipment extended to most of the important types of equipment which the combat soldier was likely to encounter. An appreciation of the significance of this training can be had by considering the shoulder weapon. In night fighting the recognition of the sounds made by various types of rifle fire is of extreme importance. Accordingly, classes were conducted by ASFEEIST with Japanese 7.7 rifles which it had acquired in the forward areas and firings were conducted in comparison with our own M1, in order to demonstrate to the doughboys the difference in the report and the spacing of the rounds. In addition, familiarization firings with other weapons were conducted for the troops in order that they could appreciate the capabilities and limitations of the weapons which they might encounter. Similarly, instructions were afforded in many other categories of Japanese combat equipment.

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*Ordnance Department. In charge of ASFEEIST in Middle Pacific Area, April, 1944, to August, 1945.

It is interesting to note that ASFEEIST personnel were called everything from battlefield scavengers to professional souvenir hunters. However, both of these rather uncomplimentary terms fail completely to convey a proper idea of the manner in which ASFEEIST personnel operated. Contrary to the inference which one might draw from such terms, the forward echelon of ASFEEIST always operated with the front-line units. If it were not for this fact, little matériel of significance would ever have been obtained because forward combat units are prone to destroy enemy equipment which they overrun in order to prevent its subsequent use by infiltrating enemy patrols. Frequently it was necessary for ASFEEIST personnel to investigate underground localities before they were examined by combat troops, and the time available for such investigations was normally very short before the engineers sealed shut the caves by demolitions.

As an example of important inferences with regard to decreasing Japanese resources that were drawn from items investigated by ASFEEIST, it was found that textiles on Okinawa had been adulterated with hemp, that steel was being substituted for brass in cartridge cases, and that buckles on newly issued field bags were cloth-covered bamboo.

Numerous technical intelligence bulletins were prepared and disseminated on all categories of captured matériel. These bulletins ranged from a guide for identifying the markings on Japanese ordnance to complete reports on fire control equipment.

The ordnance section of the team sent back thousands of Japanese artillery pieces, mortars, rifles, revolvers, automatic weapons, and rounds of ammunition. In addition a complete set of Japanese fire control equipment was sent to Aberdeen Proving Ground. The other technical services made similar contributions in their fields.

Nearly 250 tons of Japanese ordnance matériel alone were returned to the United States for both intelligence and training purposes. These shipments included automotive vehicles, small-arms weapons, grenade launchers and rocket launchers, and artillery including both field and antiaircraft, twin mount cannon, and howitzers. The miscellany of fire control matériel sent included range finders and height finders, which represented practically the entire Japanese endeavor in this field.

The Signal Section unit, consisting of four officers and five enlisted men, carried out a training program of lectures and demonstrations covering the salient features of enemy signal equipment, and also issued numerous bulletins on enemy matériel. It captured a Japanese document on auxiliary receivers used in division communication units. It returned to the States for study and use in training, six tons of enemy signal equipment which included radar, radio tubes, crystals, wave meters, radiosonde receivers, direction finders and transceivers. In its Oahu laboratory, Jap signal equipment was studied, and circuit diagrams prepared.

The work of the Chemical Warfare Service unit, which was composed of one officer and four enlisted men, consisted of interrogation of POWs. The unit assisted in training 5,000 troops in the identification of Japanese chemical warfare matériel, and prepared more than 50 reports on it. The reports included analytical surveys of such matériel, and covered items ranging from filter paper and jettisonable fuel tank fire bombs to anticarbon monoxide canisters with which the Japanese army was equipped. New items found were shipped to the States for study. The Japanese entered the Pacific Ocean areas fully equipped for gas warfare, and it was apparent from examination of their chemical equipment that they fully expected gas would be used against them.

The Engineer Section unit, of one officer and two enlisted men, working in the same manner as other sections, sent to the States 23 tons of equipment. Japanese surveying equipment was much in evidence. A searchlight reflector was captured and found to be of German manufacture. Three complete Japanese filtration units were sent to the Chief of Engineers for analysis in the United States.

The Quartermaster Section unit, consisting of one officer and two enlisted men, sent reports out on such items of enemy equipment as bulletproof vests, gasoline lamps, portable fuel pumps and protective clothing. One such report compared U. S. and Japanese combat packs.

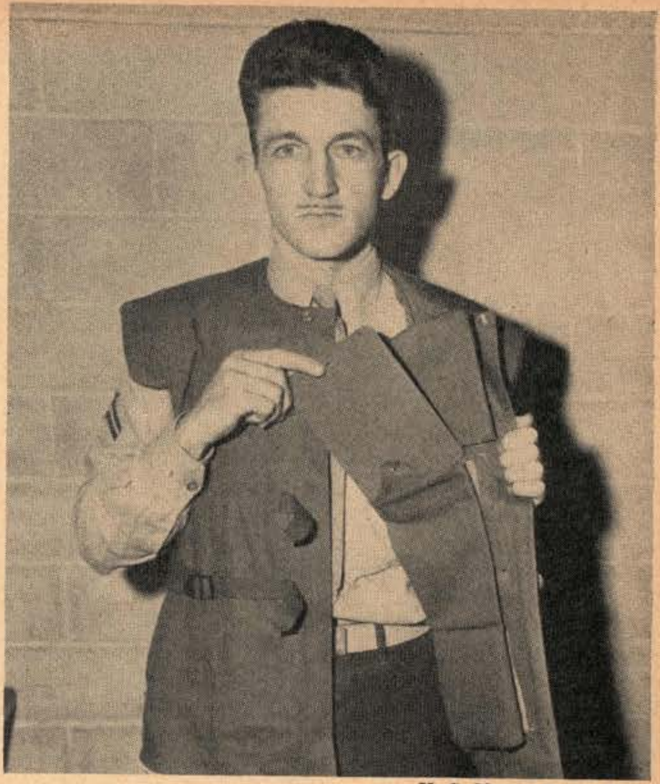
The Medical Section's contribution to enemy intelligence information was analyses of Japanese morphine, reports on the prevalence of diseases, and issuance of warnings to troops on several poisonous plants which abound on various islands. One item of considerable interest, which was forwarded with other matériel, was a Japanese microscope. A system for the identification of enemy antimalarial drugs also was originated by the medical section.

The lessons learned in the Pacific as a result of the work of ASFEEIST played an important part in the development of matériel by the technical services in the United States Army. By the process of analyzing every new item of enemy equipment the trends in the development of enemy matériel were deduced.

It is not sufficient, however, merely to make tests of enemy matériel to determine such obviously important knowledge as the range of his ammunition, the light intensity of his flares, the comfort of his field uniforms, or the effectiveness of his medicines. What is absolutely essential for appraisal of the captured item is that it be minutely scrutinized by all appropriate scientific facilities available for the job.

"BULLETPROOF" VEST

CARDED



U. S. Marine Corps Photo

WOULDN'T it be wonderful if the following statement was true?

"A new type of protective armor for the individual, pliable as silk, light as a feather, but which will turn any projectile up to an eight-inch shell, has recently been invented."

Such a statement, however, is perhaps as far from the truth as it ever was, and yet the attempt to develop individual armor which will reduce battle casualties continues.

"Good" protective armor is a relative thing. It must afford considerable protection without unduly impairing the battle efficiency of the wearer.

Protective armor for infantry has not been a practical thing for several centuries. Towards the close of this war a new type of protective armor for the individual was developed, however, which may prove to be sufficiently practical to warrant its wear under battle conditions. This armor is a fibrous rather than metallic structure. The plates of this armor are not pliable, they do weigh more than a feather, and they will not turn every projectile which the mind of man has conceived. They will not turn a rifle bullet fired at a medium range. Encasement in an armored vest of this material will not eliminate the possibility of the individual receiving a chest or abdominal wound.

An armored vest of this material is not as comfortable as an old sweater. Yet it may be sufficiently comfortable and offer a sufficient measure of protection to warrant its adoption for battle wear.

The vest is not unduly heavy, weighing approximately five pounds, with plates one-eighth inch thick. Since the plates of the armor are not pliable, they cannot be extended to cover the lower abdomen and at the same time allow the individual sufficient freedom of action. The extension of the plates to cover the lower abdomen causes chafing and discomfort if the individual does much climbing, running, or engages in other vigorous activity. On the other hand, the lower abdomen is somewhat protected by the cartridge belt, and the plates may protect all the body above the belt line.

Undeniably, the vest is hot—a disadvantage less apparent in cold climates.

Since it is hot; since it is cumbersome, if not unduly heavy; since it won't turn a rifle bullet, what good is it? The answer lies in the fact that not all wounds are caused by rifle bullets. The armor will turn a .45 caliber bullet. It will turn most, but not all, fragments. It would turn a larger percentage of fragments if it were thicker, which would also increase its weight.

The percentage of deaths resulting from wounds in the chest and abdomen is high; studies indicate that the figure runs in the neighborhood of 50 per cent.

The number of casualties from fragments is generally greater than the number of wounds inflicted by small arms—some campaigns in the Pacific being exceptions.

The armored vest would markedly reduce the number of wounds of a type which so frequently result in death. By how great a percentage would it reduce wounds in the chest and abdomen from fragments? The answer to this question may not be given definitely, but very limited tests have indicated that one-eighth inch thick plates will turn approximately 75 per cent of fragments of a 60mm mortar shell and two-thirds of the fragments of 81mm mortar shells which have traveled a distance of 10 to 40 feet. The distance is, of course, only one of several factors upon which the chances of penetration depend. In the case of fragments from the same shell, some may penetrate, others may not. The armor gives greater protection against hand grenades.

This type of armored vest might not only reduce the number of casualties resulting from fragment wounds of the chest and abdomen, but might (let's be optimistic) possibly reduce the percentage of deaths resulting from such casualties, since the multiplicity of wounds to a given individual from a given shell may be reduced.

These vests were not tested in combat. The nearest they came to it was the wearing of a few of them during the mopping up phase on Okinawa. This test did provide some information as to faults of design.

This armored vest will not provide complete protection to the upper body, any more than the helmet provides complete protection for the head. It is not completely comfortable for wear at all times, any more than is the helmet. But like the helmet, it may now offer sufficient protection and be sufficiently comfortable to make men willing to wear it in battle.

Patrols In the Jungle

CONCLUSION

An article in the March-April issue of *The Cavalry Journal* described the basic considerations which govern the operation of jungle patrols, and included such subjects as the patrol's size, assembly points and objectives, maintenance of direction, equipment, etc. The following article describes formations that are adapted to both jungle and normal terrain.

IN jungle terrain, either on trails or in the bush, patrols will operate in column formation most of the time. It is generally not feasible to have a number of separate groups hacking their way through the thick growth at the same time; progress is too slow, the elements of the patrol become isolated, and too much noise results. Movement through the undergrowth is of necessity by column. Nevertheless, provision is made for flank groups in all jungle patrols. Even though these groups may not function on the flanks during forward movements, they do move out to the limit of visibility, up to 100 yards, during halts when march outposts are established. When normal terrain is entered, the designated flank groups begin to function on the flanks in the usual manner. Jungle formations of eight men or larger may be regarded as collapsed formations, which have been drawn together by terrain restrictions, but will open out to the normal form when the restrictions are no longer present.

THREE-MAN PATROLS (SCOUT TEAM)

This formation consists of one man, armed with a rifle, who acts as a point and who is followed at 10 to 20 yards by a second man, also armed with a rifle, who in turn is followed at from 10 to 25 yards by the third man, who carries an automatic weapon. (See Figure 1.) The leading man gives his entire attention to observing the ground in the front and flanks, the second man looks for tree targets, the third man furnishes the fire power for protection of the group, and observes to the rear. The distance that is maintained between individual members of the team will vary with the visibility, as conditioned by the cover, bends in the trail, and whether the patrol is operating in daylight or in darkness. All members of the team must be constantly within visual distance of one another in daylight in order to afford mutual protection and control. At night, sound signals must be used and distances reduced.

The three-man patrol, or Scout Team, should be used on jungle trails as the point of a larger patrol, or as a small reconnaissance patrol which is to operate alone. It may also be used effectively to replace the usual scout screen employed by combat platoons during their approach march.

FOUR-MAN PATROLS

When the three-man scout team is to operate alone as a patrol, a fourth man may well be added to the group so that the leader is not required to do his part of the three-man job, but can devote his attention to planning, and supervising, the conduct of the patrol. The efficient action of the basic team is thus preserved, and it can be controlled more effectively.

SIX-MAN PATROLS

There are two methods of utilizing six men in jungle patrol formations. Whichever formation is selected, it should be appropriate to the terrain and visibility. In one the six men are arranged in two three-man scout teams, one ahead of the other, separated by a distance of from 15 to 50 yards, depending upon the visibility. The patrol leader is part of the leading team. (See Figure 2.) This formation permits flank movements by the rear group if the forward group is pinned down by enemy fire, and it also minimizes the danger of ambush

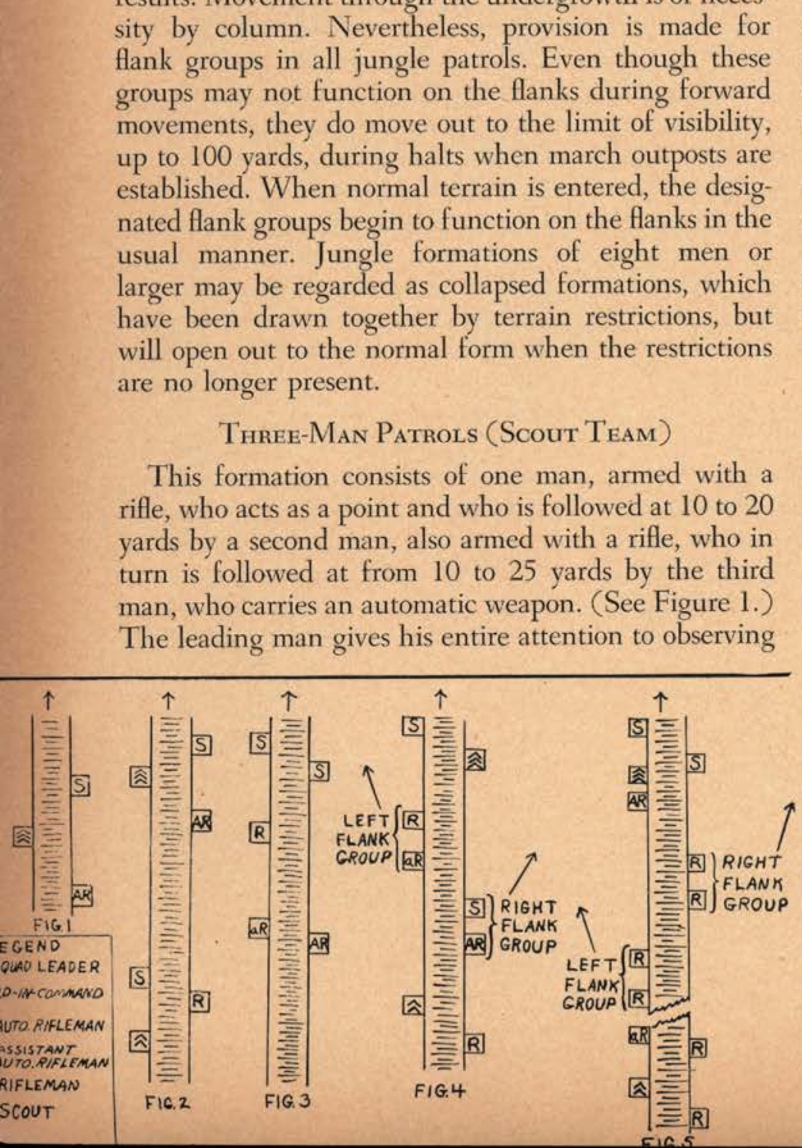


FIG. 1 FIG. 2 FIG. 3 FIG. 4 FIG. 5

of the entire patrol. The rear team can act as support group for fire and maneuver to extricate the forward group from a dangerous situation.

At other times a simple doubling of the basic three-man team works well, although there is a greater danger from ambush if members become closely grouped. (See Figure 3.) In this case the two leading scouts observe over a 90° arc to the front and opposite flank, the two following observe for tree targets on the side of the trail opposite to them, and the two automatic riflemen cover by fire any targets on either side of the trail. The control, the detailed observation, and the concentration of fire power that are made possible by this formation are favorable for the rapid location of enemy positions along trails, and effective subsequent action.

SEVEN-MAN PATROLS

When two basic scout teams are used on a patrol, efficiency is increased if the leader is not a member of either team, but is free to supervise the entire patrol. The seven-man patrol is generally superior to the six-man patrol because of the opportunity for better leadership. The leader will usually be with the leading group unless the patrol is on a well-defined trail.

EIGHT-MAN PATROLS

One natural formation for the eight-man patrol is the same as that for the six- and seven-man patrols, except that the leader and his second-in-command are both free to move about as the situation requires. The most suitable formation for eight men, however, is the normal diamond, with flank groups collapsed, and in column on the track during movement. While moving, the leading scout pair, which will include the leader, performs its normal point functions; the next two men are designated as a right flank group; the next two men form a left flank group, which observes to the right and left respectively; and the rear pair become the rear point and function as such. In column on the trail, the groups are separated from each other by from 10 to 15 yards. Upon halting, the flank groups take up flank positions off the trail and the diamond formation develops. When normal terrain is entered, the flank groups move out and the normal diamond formation is resumed. (See Figure 4.)

TWELVE-MAN PATROLS

Because of the canalizing terrain of the jungle, the same principle of using a collapsed diamond formation for eight-man patrols applies equally well to 12-man or larger patrols. The 12 men are organized so that three-man scout teams constitute the point and rear point, and scout pairs act as two flank groups. The leader is in the point group. On the march, all groups are in column behind the point, and are separated by 10 to 15 yards, depending on visibility. Upon entering normal terrain, and at the halt, the normal diamond form is adopted by having the flank groups move out at appropriate distances. (See Figure 5.)

FORMATIONS FOR NORMAL TERRAIN

The basic formations described here are not new, and have been used under normal terrain conditions for a long time. They are applicable to a great deal of terrain, and should be employed whenever conditions permit.

EIGHT-MAN PATROLS

Although an eight-man patrol may be used in a number of formations—and under certain conditions they should be used—the more common one is the diamond formation. In it the eight men are generally arranged in pairs to form the four points of the diamond. In operation, one man of the leading team observes for ground targets, while the other man, the leader, looks for tree snipers. The flank men operate similarly, with the outside man, who is the ground observer, in advance of the inside man, so that the protecting fire of the inner scout will be directed away from the patrol when his partner encounters resistance from tree snipers. The rear pair divide responsibility by having one man observe to the rear and one flank, while the other watches the patrol leader and the other flank. To facilitate control, all inside men keep in visual contact with the leader. Direction of movement of this formation is easily changed upon signal toward either flank or to the rear without interrupting the formation or the functions of the individuals.

NINE-MAN PATROL

This patrol functions in the same manner as an eight-man patrol, except that the leader is free to move from place to place as the patrol changes direction instead of serving as an integral part of a two-man scout team. There is a considerable advantage in having the leader more "mobile," although usually he will be with the point.

TWELVE-MAN, AND LARGER, PATROLS

The Diamond Formation—Four groups of two or three men each are arranged so that the entire patrol is in the shape of a diamond. Individuals within each group are separated by from 5 to 10 yards. The point and rear point groups are essentially three-man scout teams. The flank groups, of two men each, place themselves in such a position that the outer scout is slightly ahead of the inner. The leader will normally be with the leading group. Intervals and distances between the four groups of the diamond will vary according to terrain conditions, cover, visibility, and proximity to the enemy, but the front-to-rear axis of the diamond seldom will exceed 150 yards. The frontage covered will be limited by the visibility. Advantages of this formation are the all-round protection provided, the rapidity with which its direction may be changed, and the ready control it permits the leader. If attacked, the group has an all-round defense immediately available.

The Squad Column—In this formation, the men are arranged in a single column with the leader at the head.

In the column, individual members of the squad take a distance of from 5 to 10 yards from each other. The two-man scout teams stationed on the flanks may take an interval of 100 yards from the column, if visibility permits. The patrol sends two scouts forward and two men to the rear. This formation allows a great rapidity of movement and a maximum of flexibility in control. A small frontal target is presented to the enemy, and a maximum of flank observation is possible. Also, when a change in natural cover requires more detailed examination of the ground, it permits a rapid change to the skirmish line formation.

Skirmish Line (T Formation)—The men are spaced at intervals of from 5 to 10 yards in irregular line. The command group of the patrol precedes in column usually at a distance of 10 to 75 yards, depending upon visibility. Men are assigned to flank groups and detailed to observe and reconnoiter on signal. This formation has the advantage of dispersion, and permits the examination of a wide front thoroughly as well as visual communication between members of the patrol. Control during daylight is maintained by relaying signals from man to man, and at night by voice or other sounds.

Wedge Formation—Individual patrol members are arranged in such a way that a scout pair or a three-man scout team, including the leader, leads the way. They are followed at 10 to 75 yards, depending upon visibility, by men uncovered to the left and right by intervals of 5 to 10 yards. The customary dimensions per squad are a frontage of up to 100 yards, and distance from front to rear of approximately 100 yards. This formation provides the advantage of close coverage of terrain over nearly the same frontage as the skirmish line and, at the same time, it facilitates thorough observation to the flanks. Each man has a relatively small sector to observe. It provides the same ease of control of a squad column and, in addition, it may be rapidly changed to an all-round defensive group in case of attack. The end men on the two sides of the wedge are charged with observation and protection of the patrol from the flanks. Two men, led by the second-in-command, constitute the rear point. The formation has a wide adaptation and may be used in either open or close terrain, but it is not suitable for work on trails or other canalized approaches.

REPORT OF PATROL LEADER

Upon returning from a patrol, the leader makes a report to the commanding officer who sent him out. The report should be written unless the situation at the time is too mobile to permit it. The report covers the following points:

Size and mission of the patrol.
Time and departure route.
What was observed—number—composition, equipment and attitude of the enemy.
Where observed—doing what, and direction of movement, if any, with exact location.
When observed.
Nature of terrain covered.
Route and time of return.
Condition of the men and casualties.

Reports may well take the form of overlays upon which the pertinent information above may be accurately plotted, and explanatory marginal notes added, as required. Information in overlay form is readily transferred to unit situation maps and is usually more accurately reported than is possible by the use of words.

ILLUSTRATIVE PATROL PROBLEM

First Phase: The following verbal order was issued by the company commander at 0600L, November 17, 1942:

"Sergeant, I have an operation map here—get where you can see it.

"An enemy infantry battalion with some pack artillery is advancing south along the coast and was reported to be in the vicinity of Pongani yesterday afternoon" (pointing to location on map) . . .

"Our battalion will march from our bivouac here at Kinjaki to Pongani on the morning of November 20. An Australian patrol will be sent to the vicinity of Pongani today.

"Take seven men of your squad as a patrol to determine the presence or absence of the enemy and their number in the vicinity of Pongani. You will observe and report the condition of the trail" (pointing to trail on map) . . . .

"You will prepare your men for the patrol and move out at 0800L today. You will report to the battalion commander by 1200L day after tomorrow. You will meet the battalion at the stream junction south of Pongani, here" (pointing) "on November 20 to act as guides. Do not engage in a fight unless it is necessary.

"Take enough rations to last five days. See that your patrol has at least three compasses. Each rifleman will take 40 rounds of ammunition and each automatic rifleman will take 120 rounds. Take one pair of field glasses, a pair of wire cutters, and a watch.

"Battalion CP—Kinjaki until 0600L November 20.

"Send messages to the battalion CP.

"Any questions? It is now 0615L."

Second Phase: After a short period for study of the requirements, the squad leader assembled his patrol and gave the following warning order informally in his own words. He made sure that each man understood what his particular job was before continuing. He did not announce paragraph numbers.

WARNING ORDER

"Natives report that an enemy infantry battalion and some pack artillery were in the vicinity of Pongani yesterday afternoon, November 16th.

"Our battalion marches on Pongani from Kinjaki

November 20th. An Australian patrol will be operating in the vicinity of Pongani.

"Our patrol will march on Pongani at 0800L to report the presence or absence of enemy in the vicinity. Route of march: the trail shown here on my map. We must observe and report the condition of this trail.

"I want you men to draw five days' rations from the mess sergeant. Graham, take 120 rounds for your tommy gun. Brown, check the ammunition the other men have and draw enough from the supply sergeant so that every man will have 40 rounds. McDougal" (second-in-command), "make a tracing of my map, draw a pair of field glasses from the supply sergeant and be sure to bring your compass. Graham, draw a pair of wire cutters. Gilucci, draw a compass. Fall out and assemble here at 0745L. It is now 0630L. Be sure you have good shoes, no shiny equipment, none that rattles, and no insignia. Leave all papers, letters, documents that would identify us, at the company orderly tent."

After preparing his own equipment, the squad leader studied his map and prepared his order for the patrol. The squad reassembled at 0745L. The squad leader had them fall in and inspected them to see that all of the provisions of the warning order had been carried out. After the inspection was completed, the squad leader rapidly repeated the first three paragraphs above, and then continued his order as follows:

Order

"Brown and Cohen to the left.

"Gilucci, you are air scout. Work in a pair with McDougal. Have you got it?

"McDougal, observe to the rear. When I have gained 50 yards distance send the squad forward in squad column formation, opened out, seven yards interval, five yards distance. Watch me for signals. Got it?

"Graham, work in a pair with me. We will precede the patrol by 50 yards.

"First objective: our outpost line 800 yards north. The trail passes through it as shown here on the map at this stream crossing.

"First assembly point: right here.

"Password: Powder River.

"Report any enemy you see to me. Fire on my order only. Don't shoot first but take cover and watch me for signals. If I am bumped off, our messages are sent to the battalion commander here. We must report by noon November 19th. We rejoin the battalion on the trail south of Pongani November 20th to act as guides for the battalion. I will designate the exact location when we pass it.

"All of you watch out for airplanes and gassed areas.

"Do you understand what you are to do: Do you, Marcinski? If you don't, now is the time to ask questions, not down the trail.

"Alright Graham, move out. I'll follow you at 15 yards. Watch me for signals."

Third Phase: The patrol moved out to its first objective in opened-out squad column formation, because it was in territory within its own outposts. When this point was reached, a new objective was designated and a new assembly point was pointed out on the ground near the old objective. Upon entering territory outside of our outpost line, the squad again took up the opened-out squad column formation which was suitable for rapid movement along the trail.

As the patrol approached Pongani, however, more care was exercised by adopting formations in normal terrain with more dispersion, such as the diamond, skirmish line or wedge, depending upon the type of cover. When traversing jungle terrain the eight-man jungle patrol formation was used.

During each halt, march outposts were established and the bivouacs on the nights of November 17—19 were protected by double sentries working in three reliefs. Slit trenches were prepared in a form to give all-round protection in case of attack during the night.

On the morning of November 19, the patrol observed an enemy patrol of six men on the trail south of Pongani. They were going north and were talking freely as they proceeded along the trail. The message sent to the battalion commander was as follows:

"MESSAGE. No. 1. To: CO, 1st Bn. 19 November, 1942.

"No enemy troops observed west of Pongani to 0630L 18 Nov. Observed six-man dismounted enemy patrol moving north on Pongani-Kinjaki Trail 300 yards north of point where Mangare Ck. crosses the trail at 1030L today. Enemy careless and noisy. Will continue mission.

Leader Patrol No. 1
1040L
Gray, Sgt."

Fourth Phase: On the afternoon of November 20 the patrol met the battalion at the stream junction south of Pongani and the leader submitted the following report to his company commander:

"Patrol of eight men, with a mission of determining the presence or absence of the enemy in the Pongani area left Kinjaki at 0800L 17 November and followed the main track until the stream crossing over Mangare Ck. was reached. At this point the patrol left the trail and reconnoitered the area to the west of Pongani—saw no enemy. At 1030L on November 19, a six-man Jap patrol was seen on the main track going north 300 yards north of the Mangare Ck. crossing. They were talking and had no security groups out.

"Terrain was hilly and intermittent patches of kunai grass and tropical forest. Native trails are abundant in the area southwest of Pongani where many villages are located. All trails passable for foot troops and bantams. The patrol returned to the stream crossing over Mangare Ck. this morning. The men are in good condition, although Gilucci has a blistered heel.

Gray, Sgt.
Leader Patrol No. 1."

Two Years Under Wingate

*by Brigadier Bernard Fergusson, D.S.C.**

SOME hours after dark, during a thunderstorm on March 24, 1944, a B-25 crashed into a remote hillside in southeast Asia. Four Americans and four Britons were killed. A week later, the Japanese burst into Rangoon jail, chattering in exultation, to tell the Allied prisoners that Major General Wingate was dead.

At the moment the catastrophe happened his brigades were poised to close in on their objective of Indaw, a small town in Upper Burma, 140 miles down the railway from Myitkyina. Only the day before, Wingate had flown in to discuss plans for the assault with me. He had landed on a light plane strip, located 25 miles short of Indaw, that I had constructed for the purpose. Deployed in the surrounding jungles were nearly 2,000 of my men; 11 months earlier, in the same area, I had been sneaking out to India with 30 men, some wounded, most of them sick, and all near to starvation.

What was the difference between the campaign of 1943 and that of 1944? What lessons had been learned in the first, and how were they exploited in the second? What was the object in each year, and what was the gain?

Two years after Wingate's death, it should be possible to view his two greatest campaigns in perspective, and to make some assessment of his own worth, unswayed by the emotions of the moment and undazzled by his almost hypnotic personality.

LESSONS OF 1943

The 1943 campaign was no more than a demonstration; its aim was no higher than sabotage. Wingate's purpose was to penetrate far behind the Japanese lines, to play havoc with the Japanese supply system, to tie up Japanese troops on unprofitable guard duties, and thus to help the main armies in their grand advance. He proclaimed that two modern aids to war had not been fully exploited by the infantry: the first was air supply, the second radio.

Hitherto, air supply had been used only in emergency —when troops had found themselves surrounded. The Australians had used it in New Guinea, and Koenig's Fighting French at Bir Hakeim. Wingate was sure that it was reliable as the sole means of supply over a long period.

All that could be allotted him in the way of aircraft was three C-47s and two Hudsons. The Hudsons flew so fast that the canopies were stripped from the parachutes as soon as they opened, so we had to fall back on the three C-47s. Yet the system worked, and the greatest direct result of the expedition was the confidence which it engendered in air supply—a material contribution to the winning of the war in the East.

The offensive which the expedition was planned to help had to be postponed, and as a result the expedition itself came within an ace of being cancelled. But we were all keyed up to go. Wingate wanted to demonstrate that he could do what he claimed; all of us wanted to confound the skeptics. General Wavell acceded to his request, and on February 5, 1943, accompanied by the American General Somervell, General Wavell wished us good luck at Imphal.

I next saw Imphal on April 26. I had reached the first British post on the west bank of the Chindwin River two days before. Wingate was still missing, but was to turn up three days later. We had come out in the small groups into which we had split when surrounded by the Japanese who had encircled us on the far side of the Irrawaddy during the last week of March, just after we had turned for home. Most of us had had a bad time. We had been forced to jettison all our mule-loads, including wireless sets, with the result that we no longer could get food dropped from our faithful allies of the RAF. In my own small party a number of men had been lost from starvation: we had had one period of 11 days on three mugfuls of rice and

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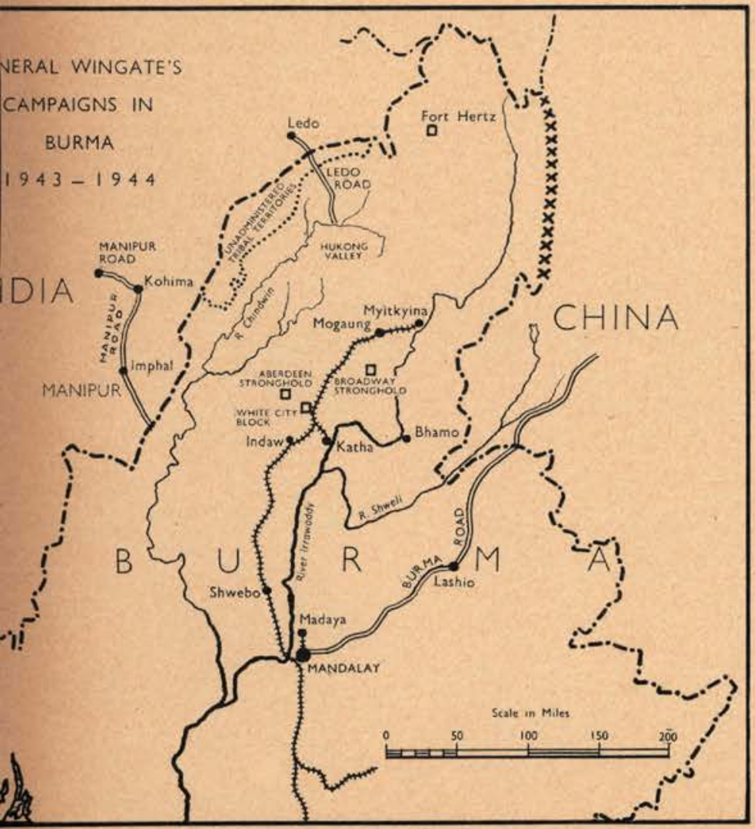
*Staff of Combined Operations Headquarters.



two malted milk tablets per man. The losses over the whole force finally came out at 35 per cent, of whom some were recovered two years later, when Rangoon was recaptured.

On the asset side, apart from demonstrating the possibilities of air supply, we had killed a fair number of Japanese; learned a lot about tactics and topography; given the enemy a great deal of irritating exercise in marching and countermarching; damaged their main railway, though not lastingly; and learned much about their defensive layout in the area. We had established also the temper of the inhabitants of the country, who had proven strongly pro-British and anti-Japanese. For every one that had double-crossed us from motives of fear or greed, a hundred had helped us at the risk of their lives, particularly when we were stumbling out hungry, sick and wounded. I know of one in particular who was mutilated and then tortured to death and yet did not divulge the hiding place of one of my wounded officers whom I had had to leave behind.

Moral Suffering

Of our sufferings, the worse were moral. Before leaving India, we all had realized that any man who was too sick or badly wounded to keep up our pace must drop out. Of all those whom I had to leave, not one complained or made it more difficult to leave him than it already was. The first party I left consisted of five wounded. All fell into Japanese hands and only one survived. My adjutant and his orderly also were captured. He was an Australian officer of my own regiment, the Black Watch, who had been in the Tobruk siege with me. The Japanese shot them both. Altogether, out of my own column of 318, 95 reached safety; and of the 80 who were taken by the Japanese to Rangoon, only 28 survived the two years of imprisonment.

A word about our loads and our food might be of interest. Every man carried 72 pounds of kit, which included seven days' rations, rifle and bayonet, jungle knife, three grenades, spare shirt and trousers, blanket, waterproof sheet, four pairs of socks, life jacket, waterbottles, and miscellaneous. We had no special kit, just the old prewar issue articles.

Our daily food ration was 12 biscuits, two ounces of cheese, two ounces of nuts and raisins, some dates, 20 cigarettes, acid drops, tea, sugar and milk. One day's rations weighed two pounds. Our orders were, however, that seven days' rations must last 10 days. We were sometimes able to eke them out with meat off a mule killed or a buffalo bought for the purpose, or rice, until the Japanese got wise to us and garrisoned all the villages to stop our foraging.

The most welcome meal I remember was of raw buffalo meat—after being without food for three days we had come upon three buffaloes and could not wait to cook them. I recall another meal of 12 loose grains of rice which I found, black and dirty, in the bottom of my pack. My normal weight of 175 pounds had shrunk to 128 by the time I reached the British lines. Two ounces of that was a chunk of metal in my posterior off a grenade, which had joined up with me 350 miles short of home.

That was the 1943 campaign. There were several reasons why 1944 was different. One was that the first show had been adjudged worth while, and Wingate had won widespread attention to his case, as well as interest in what he was likely to propose next. The second was the vast strides which his quick mind had made through his latest experience. On the way back to India he had lain doggo for a fortnight to let the hue and cry pass him by, and had sorted out the lessons of the campaign in his mind while he waited for the coast to clear. The third reason was the powerful backing which he won for himself from Mr. Churchill and President Roosevelt, and their advisers, at the Quebec Conference in August, 1943. The fourth was the devotion and enthusiasm of the American airmen of No. 1 Air Commando, under Colonel Philip Cochran, who, as a result of Quebec, now came into the game with us and joined our family.

Wingate was not prepared to be content any longer with mere raids and sabotage. He was aiming higher. His plan now was to capture an enclave right in Burma —an all-around bridgehead far beyond the enemy's lines. Let the Japanese stew as they might in the hot, valueless jungles; we would overleap them, land from the air at some strategic point where we could build and hold our own airfields, and then fly in new formations to exploit from there. We knew the country now, and we had learned which were the key roads, the key garrisons, and the reinforcement routes between each. If we set up near Indaw we could at the same time starve out the Japanese facing General Stilwell's Chinese, who were advancing painfully over the Ledo-Hukawng Valley route, and exploit our enclave.

This plan failed only because, with the Japanese thrust across the Chindwin in March, 1944, all of the troops which Wingate had hoped would be available to exploit out of the enclave were eaten up in the need to defend Imphal. If Imphal went, the Japanese could reach the Assam railway, which maintained not only the British-Indian forces round Imphal, but also General Stilwell's forces based on Ledo.

Stilwell's Material Help

The plan has been criticized on the grounds that it failed to affect the "main battle." This has the elements of truth, although it is less generous than it might be. General Stilwell's advance was materially helped; quantities of Japanese were killed, and most of their reserves engaged—all, in fact, except those who were committed to the defense of the seacoast for fear of a seaborne invasion. But the real point is that the plan was devised to assist in an offensive battle, whereas, as things turned out, the main battle that season was defensive, through no fault of the plan. It became defensive largely because the decisions made at the Quebec Conference could not be translated into reality for some little time, although they were hurried on at record speed. Cochran's air forces could not complete their assembly or deployment until February, and few if any other men could have completed these processes by then.

My own brigade was unlucky, in that, unlike the others, it was to march in again, in the old-fashioned style. We left Ledo at the beginning of February. The first of the flying brigades, Brigadier Mike Calvert's, was put down some 70 miles from Indaw between March 5 and 8; and the second, Brigadier Joe Lentaigne's, followed immediately after Calvert's. Mine reached the same area about March 22, after some hair-raising marching over much new country. (We marched 360 miles of the distance in single file.) But by this time the Japanese were pouring across the River Chindwin, subsisting on ration dumps which they had been piling up busily for many months past; they had not even any line of communications vulnerable to us. And then, Wingate was killed.

All April the fighting went on round about Indaw. The angry Japanese formations battered themselves to pieces on the blocks and strongholds which had set up under their very noses on the railway. The second week in May the Wingate force began moving north, to integrate more closely with General Stilwell's objectives on the line Mogaung-Myitkyina; and after the capture of the former town their task was at an end. In August they came wearily out. Casualties had been heavy, and sickness during the monsoon cruel, but all ranks were pleased with their achievement.

Much has been written and said about the actual airlift of Calvert's and Lentaigne's brigades, and rightly so. The technique of putting down gliders with bulldozers in unprotected country far behind the enemy's lines was new, and Lieut. Colonel Taylor's glider pilots did a wonderful job. But there was far more new stuff than that. The integration between the pilots and the men on the ground was the closest the war had seen, and all done by a nice mixture of radio, comradeship and mutual confidence. Allison and Olesen of the fighters, Mahony of the bombers, Rebori and his boys of the light planes—these American officers were far more than names to our men, but their names were known all through the infantry none the less. My own special ally was Colonel Clinton B. Gaty, who built my airfield, and lived on it with me for six weeks—a close and trusted comrade whose death occurred over Shwebo a year later.

I have said already how the most cruel feature of the first year was leaving behind the sick and wounded. In 1944 that was almost unknown, thanks to the L-1s and the L-5s of Cochran's force. They landed around villages on perilous strips which had been hastily smoothed in the paddy fields, then took off again with their emaciated wounded, and flew them back to the big strip, where British or American C-47s would come in at night to lift them back to India.

BROADWAY AND ABERDEEN

We had two principal bases in the heart of Burma. One was Broadway, the scene of the original glider landing; the other my own at Aberdeen. Broadway was in an area scantily inhabited even by natives; Aberdeen lay in a valley half a mile wide, with villages upstream and downstream, and a pleasant river, two or three feet deep, running through it. The C-47 strip, 1,200 yards long, ran due north and south. We were landing aircraft on it within three days after Colonel Gaty began work there. Our light aircraft lay tucked into the side of a hill up a little re-entrant, and their pilots lived beside them. Two defended hills covered the strip, each designed to hold one battalion in defense.

To please the villagers, and to induce them to work for us, we started a shop. In it we sold clothing, kerosene, and matches, and all the necessities of which they had been deprived under the Japanese. We paid them for working for us and then they could go and spend their earnings in the store.

Two brigades besides my own were based on Aberdeen. I was given two extra battalions to defend it, and seven AA guns. In point of fact we managed to keep the Japanese so busy covering himself from our punches that he never had leisure to try conclusions with Aberdeen except by air. Minor air raids occurred continually, but our barrage was good, and the Japs never got to close quarters. He caught us slightly once or twice, as when he shot down a C-47 just coming in to land (the pilot got her down without casualties), and again when he induced us to switch on our flare path and then dropped a bomb on the runway.

In 1944 we also fared much better in the way of food than in 1943. We never went hungry, and we had three pounds of food per man per day. I gather that the K ration is not popular with the GI. We thought it paradise, and lived on it for three and a half months, varying it only on the occasion of a supply drop when we got the addition of bully beef and dehydrated potatoes. We also got what the British soldier cannot do without—tea, sugar and milk.

A month under Wingate was worth two years in college. 1943 was pretty good hell. 1944 was all right. That second year 500 American airmen and several thousand British soldiers got to know each other inside out. If any of those 500 see these words, let them know that two Chindits cannot meet and gossip in Britain today without thinking of No. 1 Air Commando, and raising a glass.

STRATEGIST

As for Wingate (who, unlike so many of his men, was found and buried), none who served him, British or American, will ever wholly free themselves from the influence of his character. Announcing his death in the British House of Commons, Mr. Churchill described him as "a man of genius who might have been a man of destiny."

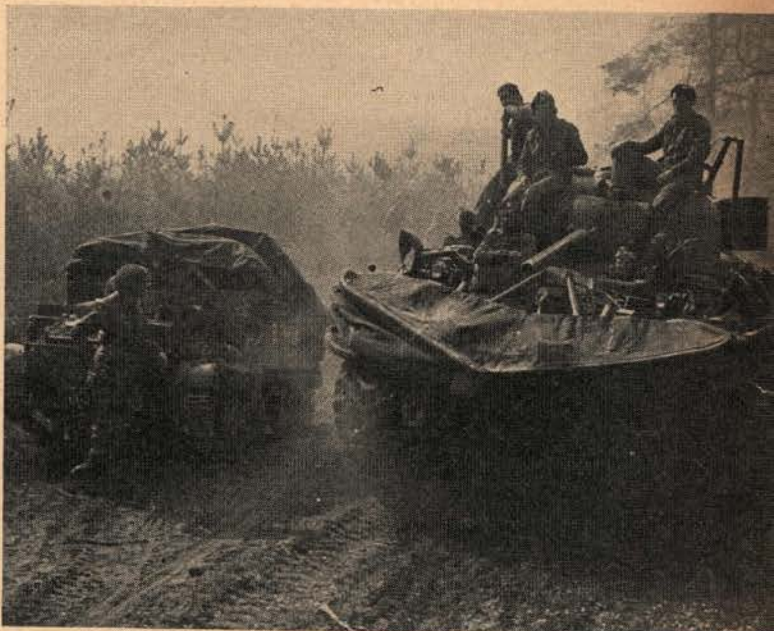
Britain's "Swimming Tanks"[*]

BRITAIN'S secret "swimming tanks"—which went ashore on D Day to rampage among German pillboxes and knock out enemy guns before they could fire on the assault waves—are estimated to have saved the lives of 10,000 Allied soldiers.

These 40-ton seagoing vehicles, known to Allied armies only by the code letters DD, which stood for Duplex Drive, saved other lives by providing immediate and adequate tank support during the crossing of the Scheldt Estuary, the Rhine and the Elbe. They were to have been one of the surprises in store for the Japanese.

Standard tanks which are brought in close to the shore on landing craft make large and vulnerable targets. But swimming tanks—which are put into the water several miles offshore out of range of the coast antitank defenses, and which ride so deeply in the sea that they resemble infantry assault boats—present small and scattered targets.

The "swimming tank" was developed after a British inventor, during the early days of the war, began experimenting with a swimming device on a Tetrarch tank which was completely successful. Later, designs were perfected which led to the production of many DDs in Britain, and the manufacture of nearly 400 in the United States.



British Official Photos

Rubberized walls attached to tanks made them seagoing. Shown above in France are Shermans with the walls down.

To make DD tanks buoyant, the hull was waterproofed, and a canvas screen was fitted on which could be raised and lowered. When the screen is in the raised position it extends above the turret level, so that when the tank is afloat only a foot or two of the canvas is above the water. The tank therefore looks like a collapsible infantry assault boat. Such an appearance proved advantageous and caused the enemy, on occasion, to engage the vehicles with small arms instead of HE fire. The resulting minor perforations had no effect upon the performance of the tanks, and the small quantity of water which was shipped was soon removed by the bilge pumps.

When the tank reaches sufficiently shallow water to be borne on its own tracks, the screen can either be lifted up at the rear for protection from the waves, and deflated partially at the front so that the turret gun can fire—or the entire screen can be dropped. Either operation is carried out instantaneously, and once the screen is lowered the tank is a normal fighting machine.

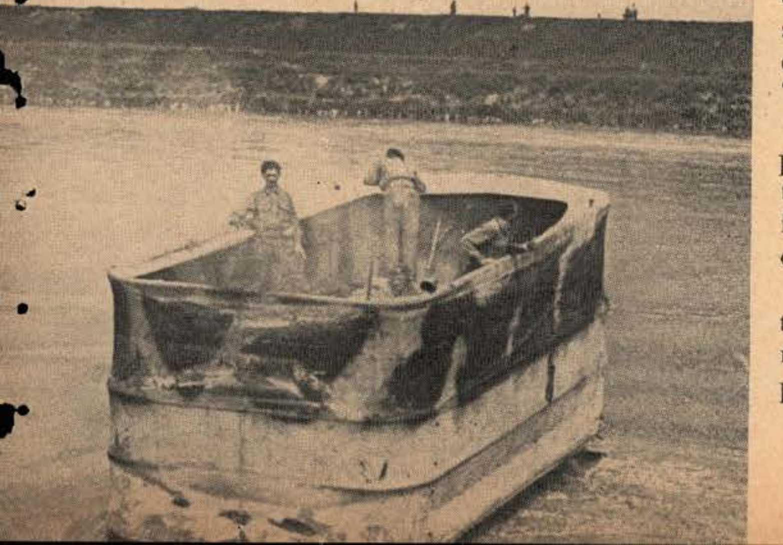
During seaborne assault operations, the DD tanks can be launched from landing craft, move through fairly rough seas, and go into action immediately upon reaching shallow water in which the screens can be lowered. In still water, a speed of four or five knots per hour can be attained.

DD tanks can also help bring in supplies during the early stages of an assault by towing to the beach floating sledges loaded with ammunition and stores, which they can drag some distance ashore. Such sledges, known as "Porpoises," were successfully employed on D Day.

The tank is propelled through the water by twin propellers at the rear which are driven from the tracks of the tank, and that can be swivelled by tillers, left or right, for steering. The propellers are raised for the clearance of obstructions when the tank operates on land.

Various auxiliary equipment must be used with the tanks, including special periscopes and compasses for navigation, and a modified form of the Davis escape apparatus, which is worn by the crew.

With its walls up, a Sherman DD, capable of four to five knots in still water, crosses the River Adige in Italy.



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[*] British Information Services.

MOBILITATE VIGEMUS
PATTON HALL

Dedication of Patton Hall

THE name of George S. Patton, Jr., was sustained in stone at The Cavalry School in April before persons who had gathered from many parts of the world to pay homage to a man whose exploits are legend.

Five thousand persons assembled before the academic building of The Cavalry School to see Mrs. George S. Patton, Jr., widow of the famed general, unveil the 14-inch bronze letters marking the beautiful native stone structure as a shrine to her husband.

Secretary of War Robert P. Patterson and General Jacob L. Devers joined with scores of other high military dignitaries to pay tribute to one of America's topmost field commanders.

"No more fitting a place for a memorial to General George S. Patton could be chosen than here at The Cavalry School," Mr. Patterson said.

"George Patton, the soldier, was first and last a cavalryman. It is only right that his memory should be honored here. The honors we pay him, the monuments we erect to him, can be only poor reflections of his place in American history. The memory of the man himself will be enshrined by generations to come as one of the greatest of our soldiers.

"All his years he bent his efforts wholeheartedly to perfecting himself as a soldier.

"He had no use for half-measures. He wrote a few days before his death that anyone in any walk of life who is content with mediocrity is untrue to himself and to American tradition.

"Three basic principles guided his life. They were an unswerving will to master his profession, an unsparing devotion to duty, and an unshakable trust in those who served with him."

General Devers, commanding general of the Army Ground Forces, then recalled his acquaintanceship with General Patton.

"I am very happy and very proud," he said, "to be in this assembly to honor my late comrade.

"I have known George Patton since we were plebes together at West Point. He was a fine athlete, a gallant sportsman and a sure leader. He exemplified the unbeatable American qualities of competitive spirit and teamwork. With them he won great battles, both for country and for his ideals."

President Harry S. Truman wired from the White House:

"I can think of no more fitting tribute to the memory of General George S. Patton than the bestowal of his honored name upon the academic building of The Cavalry School.

"A brave and gallant fighting man, his memory will be an inspiration to all our soldiers through long decades to come. Please pay my tribute of respect to General Patton's valiant widow and to the other members of the family who mourn the loss of a loving husband and father."

Mrs. Patton spoke briefly before unveiling the shining bronze letters naming the building for her husband.

"This is the place of happy memories," she said. "In our 35 years of active service in the Army, Fort Riley has been the post nearest our hearts. There is not a corner of the reservation that we Pattons do not know and love."

Mrs. Patton recalled her husband's strategy as something "fresh as bread and as old as war."

"Four words define it," she said: " 'Imagination—what would I do if I were the enemy. Reconnaissance—where is he weak, for it is there I shall strike him. Audacity—keep him off balance and keep him rocking. Pursuit—run him down.' "

"All these are Cavalry functions, and will be taught in Patton Hall, the home of the modern incarnation of the spirit of the Cavalry—going ever forward."

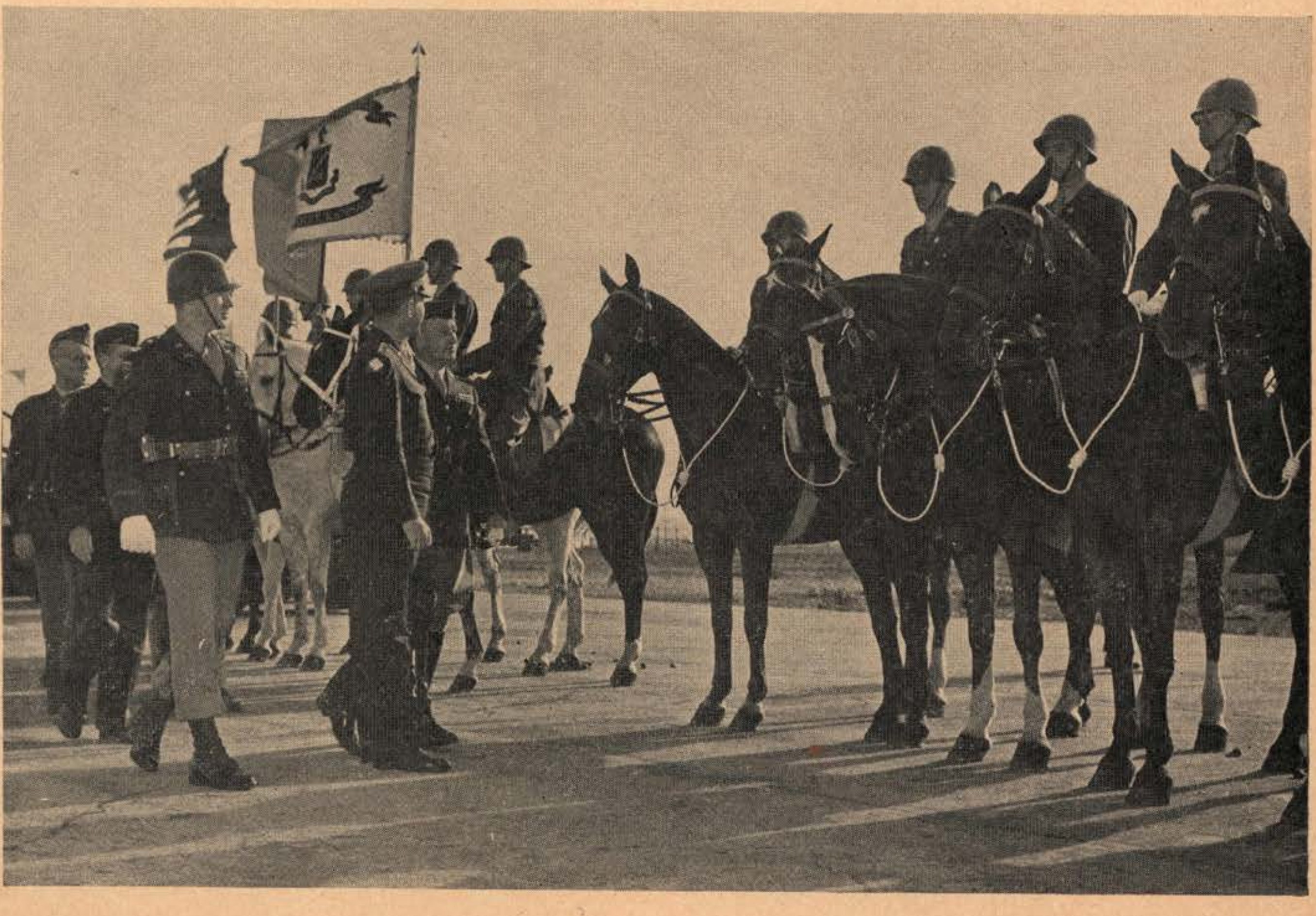
Special guests at the dedicatory exercises included Master Sergeant William G. Meeks, orderly for General Patton for eight years, who came here from Rome, Italy, and Staff Sergeant Paul Wiedorfer, Baltimore, Maryland, and Sergeant Davis E. Hardy, Richmond, Virginia, both former members of General Patton's famed U. S. Third Army.

Sergeant Wiedorfer is holder of the Congressional Medal of Honor, the nation's highest decoration for valor. He won the Medal of Honor for singlehandedly wiping out two German machine-gun nests on Christmas Day, 1944, which had pinned down his outfit near Chaumont, Belgium, in the historic Battle of the Bulge.

Among high military officers present were: Colonel Albert Le Bel, assistant French military attache, representing the French government, and Colonel Kenneth Mackessack, British military attache, representing Great Britain.

During the ceremonies, the Junction City High School a cappella choir sang "God of Battles," written by General Patton, and The Cavalry School Band played "The Second Armored Division March," written by Mrs. Patton.

General Jacob L. Devers and Major General I. D. White inspect the escort for the dedication of Patton Hall.



Fifth Army Transportation

by Captain Cecil H. Scott*

WHEN the "push" started from Anzio, the transportation section of the U. S. Fifth Army really began to operate. The section at first had had very short turn-arounds from dumps to the forward area. When the army pushed through Rome, however, and kept gaining rapidly, Fifth Army transportation found itself faced with a long supply line over which the necessary gasoline, ammunition, rations, and equipment had to be moved regardless of the long distance back to dumps at Anzio and Naples.

At this time, base quartermaster truck battalions were located at Naples and Anzio. They were hauling supplies to new dumps located in and around Rome. Many times Fifth Army convoys were sent back to dumps at Anzio. During this time highways were crowded day and night. To handle this heavy flow of traffic and to keep supplies moving forward as fast as possible, the Fifth Army organized its truck battalions as follows: Each morning a report on the total number of trucks that could be operated for a 24-hour period was sent to transportation headquarters by all truck battalions, and all convoys were scheduled by transportation Movement Control. Convoy movement forms would be filled out with the following information: time of departure from battalion area; route to travel to dumps or railhead, and on to the dumps in the forward area. Transportation control points were set up along the main roads to check and control all convoys. Time for arrival and departure at these stations was entered on the Convoy Movement form. If a convoy checked in at a station early, it would be held up and put back on schedule. If it checked in late, it would be sidetracked, and Movement Control called for new time schedule for the remainder of the trip. In this manner all convoys were kept on schedule. Where possible main roads were kept open for loaded convoys. Empty trucks were routed back over secondary roads. Since Movement Control was in contact with all check stations, traffic could be kept moving on all roads. Movement Control was in a position to clear up jams by relieving pressure on any road using check stations to re-route convoys, or on all traffic if necessary.

The British Eighth Army, operating on the right, occasionally scheduled convoys through Fifth Army areas. This caused some traffic jams at first. Later, all British convoys were required to clear with Movement Control of the Fifth Army if they were traveling through a Fifth Army area. Generally convoys were scheduled to be away from their company area for as long as 30 to 40 hours. Some means had to be set up for refueling, checking trucks for flat tires and feeding drivers. Refueling points were established along the main highway; and time for stops was entered on convoy commanders' schedules. Messes were set up and operated by cooks drawn from the battalions concerned. Time was allowed for eating, and if necessary, changing flats. All drivers were briefed on the route to travel, time of departure from battalion area, and time of arrival at all check points. This was found to be of great importance. If a driver fell out of convoy he always knew where to go and how to get there. The convoy commander knew the cargo would get to its correct destination.

Highways in Italy were all built with very narrow shoulders. Where possible, trees had been planted 10 to 15 feet apart on both sides. If a truck was wrecked or broken down, it was almost impossible to clear the road for two-way traffic. To eliminate this, a wrecker patrol was organized. All main roads were patrolled day and night. If a truck needed only minor repairs it could be repaired on the spot; if wrecked it could be towed to its own area.

Truck operations were difficult in the mountains north of Florence. In the winter of 1944, ice, snow, and extremely cold weather were encountered. Wrecker stations were set up with wreckers and snowplows available on call. These stations were furnished the schedules of all convoys coming through. If a convoy failed to show up, the operator called back to the next station to see if it had cleared the convoy through. In this way a convoy would be halted only a short time before help arrived. When troops were to be moved, strict control of highways could be maintained, and troops went through without a hitch.

Trucks returning from long trips over rough roads were found to have loose bolts. Spring U-bolts were constantly working loose causing them to break. In order to insure that all bolts were checked after each trip, First Echelon maintenance check-teams were trained in each company. A team consisted of one sergeant and three privates. Regardless of the time a convoy returned, a team checked each truck over a grease pit or rack. They tightened spring U-bolts, propeller shafts, universal bolts, all body bolts, and the nuts on all gear boxes. The team was responsible for greasing each truck and checking lube in all gear boxes. With trucks checking in at all hours of the day and night, the team proved to be of great help in checking and servicing the vehicles and in putting entire convoys of 20 to 30 trucks back on the road in less than two hours.

In truck operation during a push, it is the number of trucks on the road that count, not the ones in second, third and fourth echelon shops. With these vehicles traveling an average of 150 to 200 miles each 24 hours, it is very important that convoy speeds be controlled and first echelon maintenance be performed regularly.

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*Department of Motors, The Cavalry School.

The ARMORED SCHOOL

CARDED

THE World War I action of Cockcroft at Ypres, the cracking of the Hindenburg Line at Cambrai, and successes of German armor in Poland and the Low Countries in World War II, all served to center the attention of military leaders on the importance of armor in modern warfare.

Cognizant of the need for a school where the teaching of armored tactics and developments could be focused, General Adna R. Chaffee, on July 27, 1940, directed the organization of the Armored School and Replacement Center at Fort Knox, Kentucky.

On its activation, The Armored School had as its nucleus the 7th Cavalry Brigade, Mechanized (Reinforced) school (which became the 1st Armored Division School in July 1940), and the tank section of The Infantry School.

With these elements, which had been in existence for years, The Armored School expanded concurrently with the growth of the Armored Force. The first students were received November 4, 1940, and although the annual output of the School was originally 8,000 officers and enlisted men, within two years 38,000 officers and enlisted men were trained yearly.

Expanding rapidly, the School became the largest of its kind in the world, with over 500 buildings and equipment evaluated at over $20,000,000 and encompassing in its reservation some 50,000 acres of land upon which are gunnery and driving ranges, as well as combat and demonstration areas.

By April 1946, The Armored School had trained 12,074 officers, 12,180 officer candidates, and 69,764 enlisted men, for a total of 94,018 students. Unit after unit, from the 1st Armored Division to the 20th Armored Division and the many separate tank battalions, all had in their organization alumni of The Armored School.

On the inactivation of the Tank Destroyer School in November 1945, The Armored School incorporated tank destroyer courses in its curriculum.

The Armored School today has three main divisions: the Administrative Division, consisting of The Commandant, his staff, and the Training Group, the latter being the housekeeping unit; The Armored School Troops, consisting of tactical units which furnish demonstration troop requirements for student classes; and the Academic Group, consisting of the academic departments and agencies.

The Academic Group operates under the guidance of the Assistant Commandant and is responsible for all instruction and student administration. The actual instruction of students is given by trained officer and enlisted instructors, a vast majority of whom have had armored combat experience on the battlefields. Each instructor is fully trained in the principles of teaching before he is given actual teaching duties.

Each academic course is designed to fill a particular need of armored units. They consist of specialized courses in various departments, and integrated courses whereby the student receives instruction in several categories. The integrated courses include: Officer Candidate School, which prepares officer candidates for their duties and responsibilities as officers with armored units; the Armored Officers Course, which prepares armored officers for their duties as company or battalion commanders and as members of the battalion, group or combat command staffs; and the Armored Noncommissioned Officers Courses, which prepares selected enlisted personnel for tactical and general administrative duties within the company.

Considered as special subjects are those integrated courses which have a duration of one month or less. Among these are: Professor of Military Science and Tactics, for the training of selected personnel for duty with university ROTC units; Prisoners of War, for orientation of returned officer prisoners of war on the present status of armor; National Guard Officers and Noncommissioned Officers, for training as instructors of National Guard Units. Other special courses are offered from time to time for the instruction of selected groups, and are highly specialized.

The academic departments which make up the Academic Group are: Communication, Full-Track, Wheeled-Vehicle, Weapons, Tactics, General Instruction, and Training Literature and Reproduction.

COMMUNICATION DEPARTMENT

The Communication Department offers instruction for specialized communication courses and generalized instruction for the integrated courses. In officers' courses, the objective is to familiarize the student with the general principles involved, in order that he, as a commander of a unit, may have a working knowledge of the capabilities and limitations of his signal communication personnel and equipment. In the instruction given to officer candidates and noncommissioned officers, the objective is to familiarize them with their duties as platoon commanders, insofar as signal communications are concerned. In these courses, all essential elements of signal communication are covered with the emphasis needed placed on various phases, as: radio operation and voice procedure, wire and visual communication, and the practical application of communication security and combined communications.

Whenever practicable, officers and enlisted men function in their respective capacities during practical field work in order to train them for coördinated teamwork within their organizations. Particular emphasis is placed upon training personnel to act as instructors when they return to their units.

FULL-TRACK DEPARTMENT

In the Full-Track Department the 1st and 2d echelons of the Army system of maintenance are taught to both officer and enlisted student personnel. The courses are composed of mechanical rather than engineering subjects with a view to standardizing the basic mechanical practices involved in the maintenance of the full-tracked vehicles employed by the various arms of the Army Ground Forces.

Courses taught in this department are designed to teach students to supervise properly the 1st and 2d echelons of maintenance that should be performed by the troops in their charge. Familiarization with the various basic types of tracked-vehicles and their characteristics, capabilities, and salient maintenance needs are taught, and "Before," "At Halt," and "After Operation," preventive maintenance practices are emphasized. Importance is placed on leadership and methods of instruction in order that the student can act as an instructor in his unit.

GENERAL INSTRUCTION DEPARTMENT

The General Instruction Department is divided into the Instructor Training, Map Reading and Field Engineering, Night Vision Testing and Training, and Administrative Subjects Divisions.

The Instructor Training Division teaches the "methods of instruction" which include the principles of learning, preparation and presentation of subject matter, test construction and evaluation, and practice teaching. This division also conducts a course in leadership, and trains all newly assigned instructors of the school.

The Map Reading and Field Engineering Division teaches map reading, aerial photograph interpretation, and pioneer engineering.

The Night Vision Testing and Training Division conducts classes in the theory of night vision and the practical application of this science.

The Administrative Subjects Division conducts training in company administration. The courses are comprehensive reviews of the administrative procedures within the company. They enable the students to understand more fully many administrative problems which arise within the company and to cope with these problems more effectively. Clerical courses for enlisted students are also given in this division, which include the study of typing and shorthand.

TACTICS DEPARTMENT

The Tactics Department offers only phases of the integrated courses of the School curricula. Courses are divided in scope dependent upon the purpose of the course and experience of the student.

Instruction is given in combat intelligence; tactics and technique of light, medium, and heavy tanks armed with 75mm, 76mm, and 90mm guns; tactics and technique of small arms to include the cal. .50 machine gun; tactics and technique of the armored section, platoon, company, and battalion in all types of operations including their part in the Infantry-Artillery-Tank-Air team; scouting and patrolling; reconnaissance and security; orders and messages; organization of armored units; supply and evacuation; marches; tactical employment of units, alone and with other arms; air-ground liaison and coöperation; the evolution of tactics and the effect of modern means and methods thereon. In conjunction with School troops a large part of this instruction is carried into the field where the student "learns by doing."

WEAPONS DEPARTMENT

The Weapons Department provides instruction in the care, operation, mechanical functioning, marksmanship, and service firing of all weapons used by armored units. Officer students are trained to become qualified instructors in these subjects. They are provided with a comprehensive, direct fire tank gunnery course and familiarization with the latest tank weapons and tank indirect fire procedures. Enlisted students are trained to become qualified assistant instructors or armorers and artillery mechanics. Officer candidates are provided with instruction not only in technical data but also regarding their prospective duties as a company officer, relative to training tank crews in care and manipulation of weapons.

WHEELED-VEHICLE DEPARTMENT

The Wheeled-Vehicle Department trains maintenance officers and enlisted automotive mechanics. Training includes a comprehensive review of the Army system of maintenance with detailed study relative to the 1st and 2d echelons of maintenance of wheeled- and half-track vehicles. Officers and enlisted men are trained in automotive mechanics, each for his particular type of duty regarding the supervision for correct operation, care, and preventive maintenance. In all of these courses basic instruction is given in the armored maintenance systems, principles of engine operation, fuel and electrical systems, chassis units and suspension systems, forms and records, inspections, and driver selection and training. The emphasis or elaboration of a particular subject is made dependent upon the type class being taught. Stress is placed on leadership and methods of instruction so that each student upon return to his unit may act as an instructor.

TRAINING LITERATURE AND REPRODUCTION DEPARTMENT

An integral, though comparatively inconspicuous branch of The Armored School is the Training Literature and Reproduction Department. Here skilled artists, draftsmen, photographers, linotype operators and printers perform the technical functions that are necessary to the production of a mass of instructional material.

A staff of experienced editors in this department review, edit, and rewrite lesson plans, field manuals, technical manuals, examinations, training schedules, and similar material. Here, all charts, maps, overlays, photostats, diagrams, and sketches used in Armored School instruction are produced. In the printing plant of the department three offset presses and five smaller platen and direct presses produce huge quantities of material for the School, as well as for Army Ground Forces and components of the Fifth Service Command.

Recently this department also assumed responsibility for the editing and administration of Army Extension Courses prepared by personnel of the School.

TRAINING GROUP

The Training Group, part of the Administrative Division, has an important rôle in the smooth functioning of the School. It is an administrative and housekeeping organization and is responsible for the billeting, rationing, and administration of the enlisted personnel of the School. It also houses and rations both officer and enlisted students, and supervises the bachelor officers' quarters and messes operated for the assigned officer personnel of the School. The Training Group is composed of the Instructor Battalion, the Student Battalion, the Student Officer Company and the WAC Detachment.

ARMORED SCHOOL TROOPS

The Armored School Troops consisted initially of a number of Table of Organization units and the Demonstration Regiment. These units were originally assigned to the School, placed under this headquarters and began to function with the dual mission of performing school assignments and carrying on unit training. Many of the units used by School troops have been completely trained and engaged in actual combat. Also many trained units were transferred to other continental stations, or in some cases, were inactivated and used as replacements. Troop requirements, ranging from a driver operator with a quarter-ton truck and radio, up to exercises involving three or four armored battalions, with supporting arms and services, have been requested for school demonstrations. These troops are used to illustrate the employment of all basic Ground Force arms: tanks, field artillery, tank destroyers, infantry, cavalry, and engineers. The culmination of classroom instruction is the practical work wherein the student "learns by doing." The officer candidate and officer students learn to drive armored vehicles on various types of terrain. Tactics are studied by observing actual troops on the ground. Details of arranging infantry-tank, tank-artillery, and infantry-engineer coöperation are worked out by the students, who take over command and staff positions and put their plans into effect on the ground. Using radio equipment organic to armored units, OPs are set up and manned by students studying staff procedure. The use of camouflage, the methods of mine-field laying and removal, and the use of screening smoke are observed under field conditions. In short, Armored School Troops take the instruction to the field.

BOOK DEPARTMENT

In addition to the aforementioned departments, the School also operates the Book Department, consisting of the Library and Book Shop. The shelves of the library hold a collection of 7,000 volumes, largely pertaining to military subjects and to the technical aspects of Army equipment. It also maintains a file on pertinent Field and Technical manuals, War Department circulars, and Army Regulations. The library obtains the latest books and subscribes to all the service periodicals and the New York *Times,* making it a source of reference material for assigned and student personnel of the School.

The Book Shop operates a main store and a branch store, which stock for sale those materials and supplies which are not items of issue but are aids for students, instructors, and assigned personnel in the performance of their duties. It also carries for sale War Department publications, nonmilitary textbooks, and Army Ground Forces approved School publications. It is prepared to secure, at the most reasonable cost, any text or publication desired by students or instructors.

Through this integrated network of departments, The Armored School has functioned, since its inception, as the training ground of American armor and armored personnel.

The postwar aim of The Armored School is to offer to its students the latest in armored developments and tactics, and the application of lessons learned in World War II.

With a life span of only five and one-half years, it must be admitted that The Armored School has accomplished educational procedures outstanding in military history. Successes of American Armor in World War II attest to the efficiency and well-founded principles taught at The Armored School.

Tanks, jeeps and other vehicles of the 9th Armored Division, U. S. First Army, make a brief stop in Carweiler, Germany, before pushing on to their next objective. 1945.

Men of the 11th Armored Division fire from behind one of the division's tanks on the town of Kepple, Austria.

31st Div ?
65th DIV

U.S. ARMORED DIVISIONS IN WORLD WAR II

(To be continued)

Signal Corps Photos

A tank of the 10th Armored Division, of the Seventh Army, enters Rosswalden, Germany. Civilian at right prepares to put water on her home, set afire by other tanks.

A combat command of the 12th Armored Division, the 43d Tank Battalion's Company B, Seventh Army, drives toward Nurnberg, birthplace of Nazism. Here the column waits by a woods for the completion of a near-by by-pass.

Book Reviews

TOP SECRET. By Ralph Ingersoll. Harcourt Brace and Company. $3.00.

After seeing experience in North Africa, Ralph Ingersoll went to England in the spring of 1943, as a staff captain in the infant American Army. From then on he served in the strategic and tactical planning sections of a number of senior commands, rising to the rank of lieutenant colonel. For some months before and immediately after the invasion he was an American observer attached to General Sir Bernard Montgomery's staff. From the battle of St. Lô on, he was in the plans section of General Omar N. Bradley's field headquarters. Throughout the campaign in Europe he did liaison work between the staffs of Bradley, Montgomery, and Eisenhower. He took part in the D-day assault in Normandy; other times he was attached to combat commands where he was able to observe the results of high strategy at the fighting front.

And from this experience, he draws his uncensored, inside story of how the generals planned and ran the invasion of Germany. Beginning in London a year before D-day with the conflict between the Americans and British over whether or not there should be an invasion of France, it is a behind the scenes narrative of the great events of our war in Europe as seen from the map rooms of the planners and trailer headquarters of the top field commanders.

Falling in with the trend toward telling the story of each top-flight General in his turn, Ingersoll has made General Omar Bradley the hero of his story. As has been the case with the other writers and their heroes, the author contends that Bradley was perhaps most responsible for Allied victory. This time alone will tell, but the important thing is, the Public is offered an inside view into the life of one of the ablest commanders in American history. In addition, *Top Secret* is a record of personal and national conflicts behind the front of Anglo-American collaboration, written with neither political axe to grind nor official record to uphold. It is a book you will surely want to read and own.

* * *

CORAL COMES HIGH. By Captain George P. Hunt, USMCR. Harper & Brothers. $2.00.

Within the limited pages of Capt. Hunt's story is an itemized bill of what one bleak patch of coral in the middle of the Pacific costs, and this is a minor item in the "blood, sweat, and tears," shed during this war. 48 hours of combat on Peleliu—48 pages of personal glimpses of the heroism, bravery, and self-sacrifice of Capt. Hunt's company which tell of the heavy casualties sustained in a seemingly hopeless position.

This story is told in a simple style that somehow makes its dynamic happenings stick in the mind, and, as is typical of brave men, the author tells in matter-of-fact language of the casualties along the beach sector: "Another explosion and whine—hope that one got a couple of 'em—I had seen Bennett very solemnly sitting in a shell hole looking at a picture while bullets were clipping the brush around him.

'What are you doin'?' I asked him.

'Lookin' at my wife's picture. Wonderin' if I'll ever see her again.' "

George P. Hunt served in the 1st Marine Division in the South Pacific and was decorated with the Silver Star and the Navy Cross, the latter for his part in the action described in this book. A graduate of Amherst College he is now a writer on the staff of *Fortune* Magazine.

This is the story of fighting men told by a fighting man. After reading it you will agree that "coral comes high."

* * *

WORLD WAR II: A CONCISE HISTORY. By Roger W. Shugg and Major H. A. DeWeerd. Infantry Journal Press. $3.00.

World War II: A Concise History is offered to Americans as a brief but complete history of the war to VJ Day. Students of history as well as the general public will welcome this book as an aid to completing their mental picture of what happened in this the greatest war of all time. It is a complete battle-by-battle account, largely military but not technical in language. Though it is not a book to be read for pleasure, it is excellent for study and reference.

* * *

AND ANOTHER THING. By Howard Spring. Harper & Brothers. $2.50.

"What an unaccountable thing human memory is! It is stuffed with unrelated odds and ends, matters of no significance or value, and these will not depart to make room for all the great moments, the vital experiences, as we choose to consider them, that we would gladly remember." And thus Howard Spring opens his latest book, aptly described as "random reflections." How else could one describe this work that deals with autobiography, reminiscence, literary criticism, theology and philosophy, war and pacifism, passing from one thought to another just as the human mind will when given free rein to wander. This original purpose of the author, to let the mind wander from thought to thought drawing from each its true essence, is accomplished in a clear, simple style with a beauty that sometimes haunts the mind.

The title of this book is, indeed, one to capture the imagination and the reader will not be disappointed in the perusal of this new and unique writing.

One of the Most Important Stories of World War II

PATTON and HIS THIRD ARMY

By

COLONEL BRENTON G. WALLACE

The biography of an army. The story of one of the most amazing feats of history.

$3.00

PATTON: The Fighting Man

By

WILLIAM BANCROFT MELLOR

The story of the most colorful general of World War II. A biography that every cavalryman will want to own.

$3.00

MY THREE YEARS WITH EISENHOWER. By Captain Harry C. Butcher, USNR. Simon and Schuster. $5.00.

General Eisenhower's Naval Aide, Captain Harry Butcher, kept a diary which is more than one man's personal diary; it could have been written only by a man who lived with Eisenhower day and night and acted as personal friend and confidant. In his introduction, Captain Butcher writes, "I wish to make it clear to the reader that this is my responsibility and not General Eisenhower's. Yet I like to think that, although I wrote this book, General Eisenhower lived it."

This book is a new kind of history written in the midst of mighty happenings as they were occurring. It will, no doubt, become a source book for historians in years to come, because it is an authentic account of the North African invasion, the cross-channel invasion, and the final disintegration of the German armed force. Yet it is more than history; it is a backstage account of a great drama, revealing intense human interest, grand strategy, and intimate glimpses of key members of the Allied family.

Of the author's style, it may be said that it is simple, as may be expected of a diary, yet it never fails to hold the reader's interest. The book contains authentic pictures and maps; it is well indexed; its 900 pages are packed with interesting, epoch-making events and delightfully human trivia; in short, it is well worth the reader's time, a welcome addition to any library, and a book that the military man of today will surely want to own.

* * *

BASTOGNE: THE FIRST EIGHT DAYS. By Colonel S. L. A. Marshall, assisted by Captain John G. Westover and Lieutenant A. Joseph Webber. Infantry Journal Press. $3.00.

Many stories of combat told by a man who "was there" when it happened, have been written, and still another of these is Colonel Marshall's on-the-spot story of one of the most famous and most bitter fights of World War II in the European Theater. His story is based on material gathered firsthand by an Army historical unit, the men of which were actually present in Bastogne during the fighting. To lend clarity and interest to the text, the book is illustrated by ten drawings, sketched from life, 24 maps, and 32 pages of pictures. In addition the end papers are a reproduction of the famous "Christmas Overlay"—a kind of military map which carried simultaneously information of the enemy and Christmas Greetings to the defenders of Bastogne.

Of *Bastogne, The New York Times Herald* says: "What Colonel Marshall has set down is the story of how armor, artillery and infantry of many different units—the famous 101st Airborne Division was by no means alone—were welded into a fighting team for the defense of Bastogne. It is the story of how this team, with skill, determination and confidence, stood its ground and did a difficult job in some of the darkest days of the war. Colonel Marshall's book should be excellent source material for historians, but it is rough going for the general reader."

STRATEGY OF THE CIVIL WAR. By Barron Deaderick. Military Service Publishing Co. $2.50.

Barron Deaderick, born near Memphis, Tennessee at the close of the Civil War, early in life became interested in a study of history and military campaigns. He was long associated with the Sons of Confederate Veterans as Historian-in-Chief and thus enjoyed ample opportunity to study and analyze the basic principles of strategy employed by the Confederate and Union commanders. This abundant source material for a study of the principles of war has been liberally drawn upon in *The Strategy of the Civil War*.

The author's object is to analyze and compare the application made by both Union and Confederate commanders of the basic principles of strategy. To attain this object, he deals with each battle and its officers in such a way that both military and lay readers will find it interesting. Added interest is furnished by his maps of the territory surrounding the battle grounds.

In short, here is a brief, concise and interesting study of the Civil War.

* * *

SCIENCE YEAR BOOK OF 1946. Edited by J. D. Ratcliff. Doubleday & Company, Inc. $2.50.

Here is the fifth in Mr. Ratcliff's series of Science Year Books providing an intriguing compilation of the best in scientific articles of the year. Divided into four parts, Physics and Chemistry, Medicine, Agriculture, and Aviation and other Sciences, the book contains such titles as "The Atomic Age Opens," "Chemical Magic," "Atomic Power," "The Immediate Future," "Cancer: Notes of Hope," "Radio Telephones for Everyone," and "Long-Range Weather Forecasting" and many more. In addition Mr. Ratcliff's introduction covers scientific advances not discussed elsewhere in the book.

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* * *

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Carlos Bulosan had dreamed since early childhood, when his older brother came home from serving with the American army in World War I, of the day when he would leave his native village of Binalonan, on the island of Luzon, and go to the shining land of America. In realizing his dream Carlos meets with bitter disillusionment and betrayal, yet holds his faith in America. Because he believed so stubbornly in America, he has finally found her—"in the heart."

The book is interesting from its beginning in Binalonan where the Bulosan family struggled to eke out an existence from the soil and educate Macario, an older brother of Carlos; through the struggles and disappointments of the young immigrant in America; to its end when Carlos realizes success with his pen. This is a sometimes tragic but always brave story written with the oblique humor and tenderness which marked his former book, *The Laughter of My Father.*

* * *

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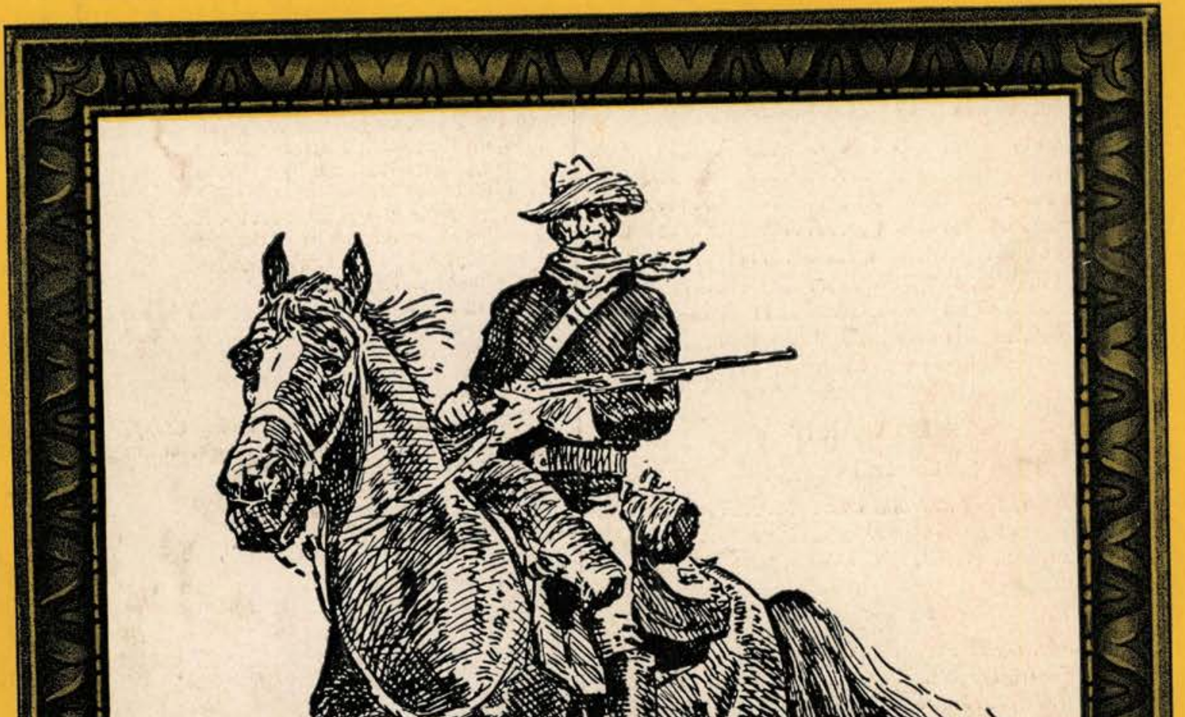
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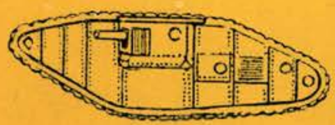

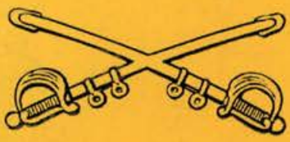

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JULY-AUGUST, 1946

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The 113th Cavalry Group

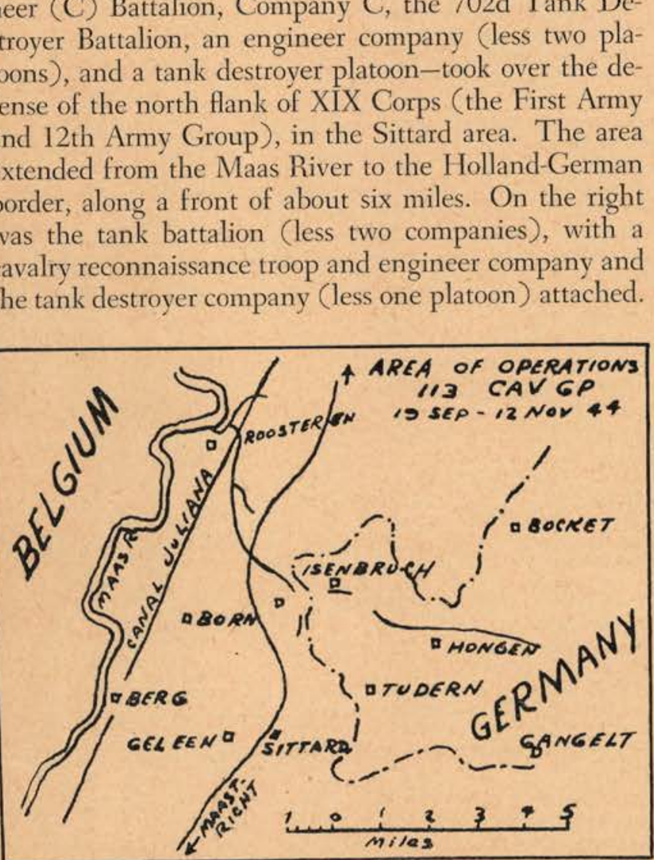
Defense of the north flank of the 12th Army Group, Sittard area, September 19-November 12, 1944.

SECOND OF A SERIES

DURING the night of September 19-20, 1944, the 113th Cavalry Group—composed of the 113th Cavalry Reconnaissance Squadron, the 744th Light Tank Battalion (less one company), the 246th Engineer (C) Battalion, Company C, the 702d Tank Destroyer Battalion, an engineer company (less two platoons), and a tank destroyer platoon—took over the defense of the north flank of XIX Corps (the First Army and 12th Army Group), in the Sittard area. The area extended from the Maas River to the Holland-German border, along a front of about six miles. On the right was the tank battalion (less two companies), with a cavalry reconnaissance troop and engineer company and the tank destroyer company (less one platoon) attached. On the left was the cavalry squadron (less a reconnaissance troop), with a company of engineers and a platoon of tank destroyers attached.

Early September 20, the work of organizing the position was begun, and aggressive reconnaissance was initiated to the north where contact was established with the enemy elements of the 176th Infantry Division, which were supported by artillery and tanks. The terrain east of the German border was open and gently rolling, and provided excellent fields of fire and observation. West of the border, the ground was generally flat and wooded and cut with numerous drainage ditches. At 1200 September 22, the 113th Cavalry Group assumed responsibility for a widened sector which extended to Gangelt, Germany, four miles to the east.

From September 29 to October 3, the 113th Cavalry Group (the 125th Cavalry Reconnaissance Squadron, less Troop B, rejoined it on September 30) advanced its line four miles to the left, forced a temporary vehicular crossing over Saeffelen Beek near Isenbruch, and took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19 SEP - 12 NOV 44
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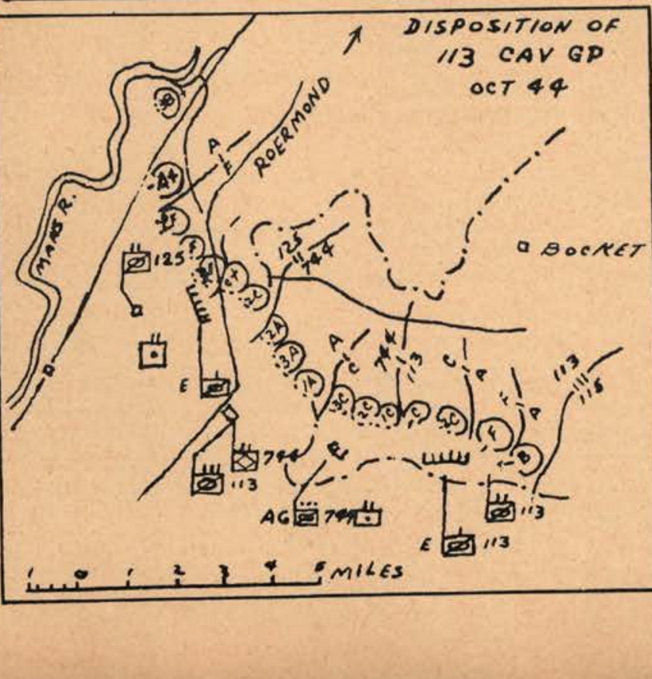
DISPOSITION OF
113 CAV GP
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ROERMOND
BOCKET
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744
113
E
AG
A
C
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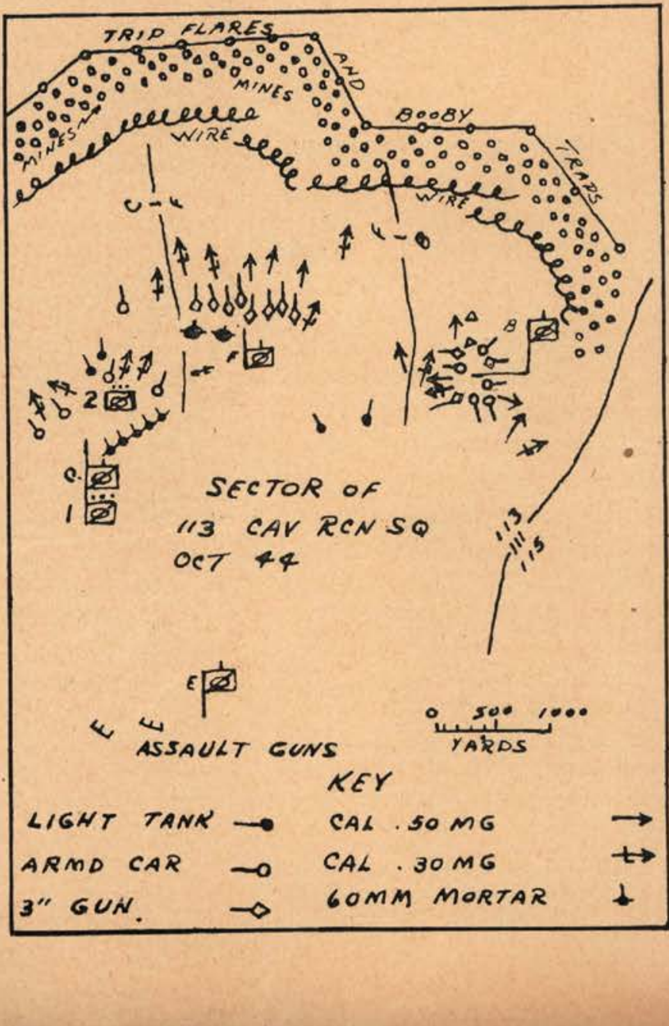
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CAL .30 MG ↔
60MM MORTAR ⊥

part in a general offensive action launched by the 29th Infantry Division. Thereafter, the group resumed the defensive, with three units abreast from left to right in the following order: the 113th Cavalry Reconnaissance Squadron, the 744th Light Tank Battalion (less one company), and the 125th Cavalry Reconnaissance Squadron (less Troop B). The only reserves available were one platoon for each unit. Up to three light and two medium artillery battalions, whose organic assault guns proved invaluable, supported the group. Aggressive patrolling was conducted, and much information of the enemy was gained. Every practicable measure was taken to strengthen the defense of this vital line, which was based upon no appreciable water obstacle.

On November 2, the 17th Cavalry Reconnaissance Squadron, normally a part of the 15th Cavalry Group, took its place in the line and relieved the 125th Cavalry Reconnaissance Squadron, which passed into group reserve. From then on, it was possible to rotate complete units from the line into reserve, and the effect of this system was very beneficial. However, it was not used long, for on November 12, the Guards Armored Division of the 30th British Corps relieved the 113th Cavalry Group, which then passed into reserve.

To summarize this performance by the 113th Cavalry Group: a division-seized front was successfully held for six weeks while larger units of the corps were operating against the Siegfried Line; mechanized cavalry demonstrated remarkable staying power, although little rotation of units was possible; a need for a third squadron, to provide a mobile reserve and to make possible the relief of units long committed, was keenly felt.

* * * *

The 113th Cavalry Group

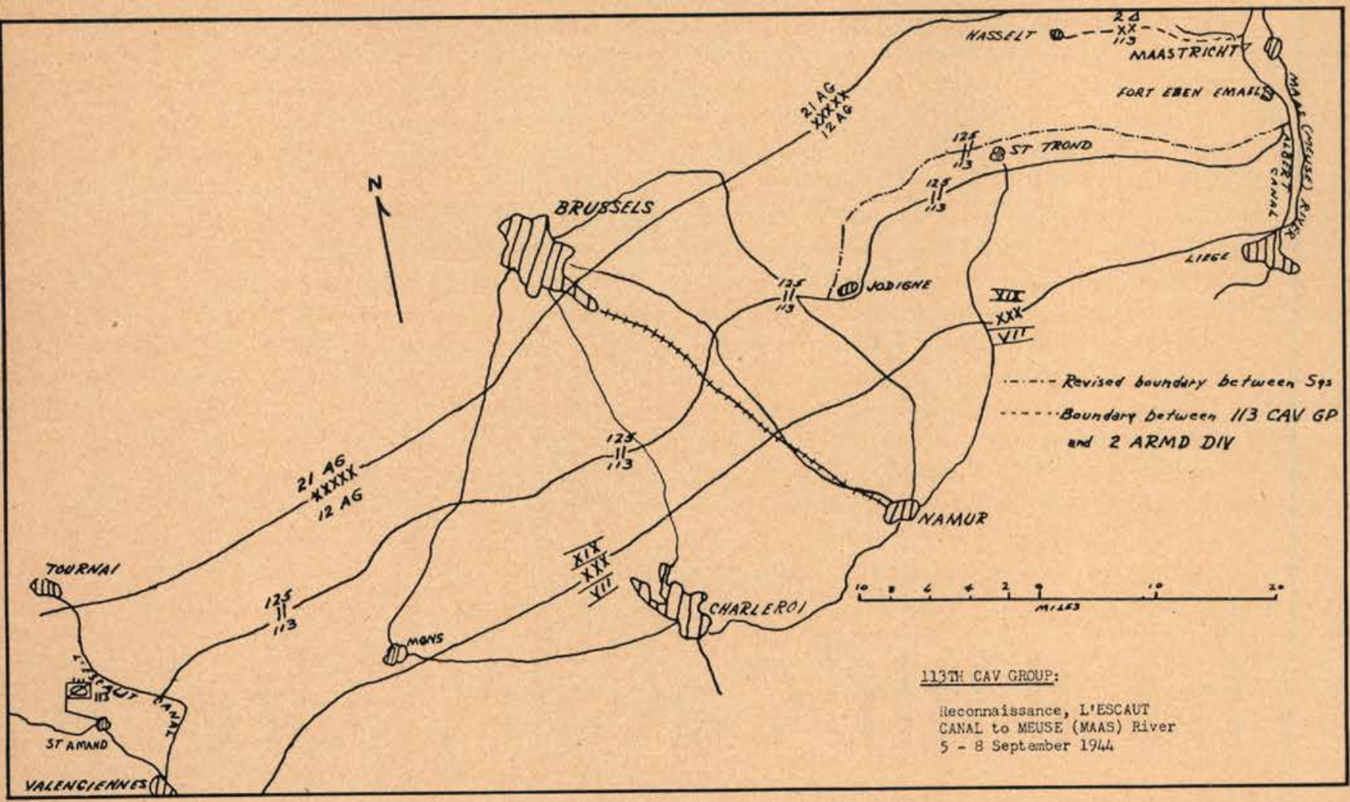
Reconnaissance of XIX Corps zone of action, L'Escaut Canal to Albert Canal, September 5-8, 1944.

ON September 4, 1944, the 113th Cavalry Group (Mecz.), which was bivouacked south of Tournai, Belgium, received the mission of moving across the L'Escaut Canal early September 5, to reconnoiter aggressively east and northeast in the zone of action of the XIX Corps. This zone comprised a strip of land 20 miles wide and 125 miles long, which passed between Charleroi and Brussels, both exclusive, and struck the Meuse River between Liege, exclusive, and Maastricht, inclusive. The enemy situation was to be determined. Strong opposition was to be by-passed. The condition of roads and bridges on the five principal routes, which the corps planned to use in its main advance, was to be reported. The 113th Cavalry Group, which comprised, besides group headquarters, the 113th Cavalry Reconnaissance Squadron and the 125th Cavalry Reconnaissance Squadron (less Troop B and Company F), was to be reinforced by Company B, 82d Engineer (C) Battalion, and Company C, 803d Tank Destroyer Battalion. No support could be expected from the main combat elements of the corps, for it was temporarily immobilized because of a gasoline shortage.

Early September 5, the advance was begun, with squadrons abreast, the 113th on the right, and with a platoon of engineers attached to each squadron. On September 6, a tank destroyer platoon was also attached to each squadron. Squadrons advanced with two cavalry reconnaissance troops abreast. By night September 5, the line of the Namur Brussels Railway had been reached against enemy resistance, which was scattered and generally light until late in the day when the 113th Cavalry Reconnaissance Squadron encountered stiff opposition. Early September 6, the advance was resumed, with the 113th squadron in sharp contact throughout the day and the 125th squadron making favorable progress on its left, although delayed on its right at Jodigne until this resistance was by-passed.

On September 7, the 113th Cavalry Reconnaissance Squadron fought its way to St. Trond, where strong resistance was encountered, while the 125th Cavalry Reconnaissance Squadron, now reinforced by Troop C of the 113th Cavalry Reconnaissance Squadron, advanced to the vicinity of Hasselt, which was captured before dark.

By this time, the 2d Armored Division had refueled, and its reconnaissance elements had overtaken the 113th Cavalry Group. The corps commander decided that the 2d Armored Division would operate in the left portion of the corps' zone; and at 0800, September 8, the 113th Cavalry Group received orders to close in to the right. By midafternoon the Albert Canal was reached by all troops, and by dark it had been determined that all bridges over the canal and the Meuse (Maas) River had been destroyed by the enemy. The 113th Cavalry Group screened the line of the canal, and at the same time reconnoitered Fort Eben Emael and the area lying between the canal and the river. When the 30th Infantry Division came up on the afternoon of September 10, the group disposed itself to cover the division's flanks.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LIEGE
XIX XXX VII
Revised boundary between Sqs
Boundary between 113 CAV GP and 2 ARMD DIV
NAMUR
TOURNAI
CHARLEROI
MONS
MILES
ST AMAND
VALENCIENNES

113TH CAV GROUP:

Reconnaissance, L'ESCAUT CANAL to MEUSE (MAAS) River
5 - 8 September 1944

Mechanized cavalry's self-sufficiency was well illustrated in this operation. It is also of interest that although this was a reconnaissance mission, most of the resistance encountered had to be fought and defeated in order to permit the 113th Cavalry Group to advance and accomplish its mission.

* * * *

The 2d Cavalry Reconnaissance Squadron

Crossing of the Moselle River and seizure of Wincheringen as a diversion for an attack by the XX Corps, February 19, 1945.

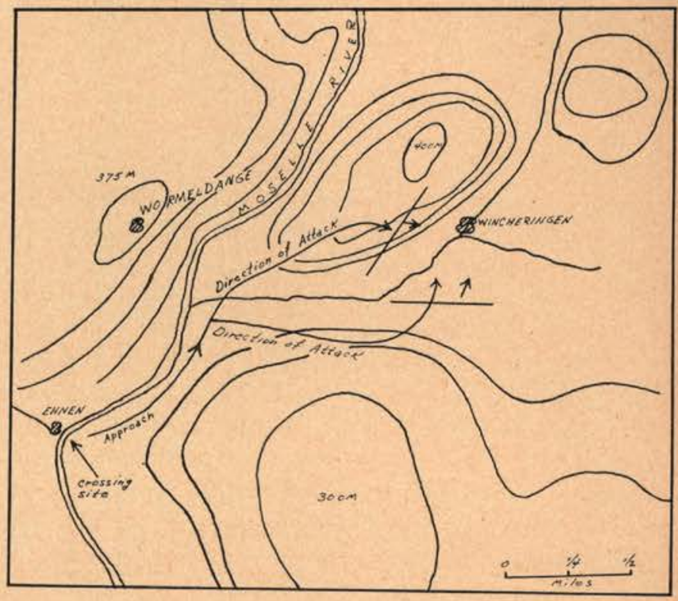
THE 2d Cavalry Group, heavily reinforced as Task Force Reed, was ordered to make a crossing of the Moselle River during the night of February 18-19, in squadron strength, and to seize and hold the town of Wincheringen. At the time orders were received the 2d Cavalry Group was defending the west bank of the Moselle River from Haute Kontz to Mertert. The purpose of the operation was threefold: to create a diversion to assist the offensive of the XX Corps, scheduled to attack north at 0600 hours, February 19; to clear the Saar-Moselle triangle; and to capture Trier. It was expected that leading elements of the 10th Armored Division with one chemical smoke generator company attached would reach Wincheringen by 1600 on February 19.

At this time, the enemy troops in the Saar-Moselle triangle comprised elements of the 11th Panzer Division, the 416 Volks Grenadier Division, and two fortress machine-gun battalions. The divisions were generally facing south, opposing the XX Corps. However, combat groups of the 11th Panzer Division were in reserve east of Wincheringen, and the line immediately around Wincheringen was held by the 44th Fortress Machine-Gun Battalion, one company of which occupied the town and manned outposts on the riverbank. Some artillery and mortars supported this company.

The battalion reserve was located several kilometers to the east.

Wincheringen was dominated by hills on the west, north and south, and possession of these hills would assure capture of the town and assist in repelling counterattacks. Secrecy in crossing the river and launching the attack before enemy reinforcements could arrive was considered essential. It was decided not to cross opposite Wincheringen but at Ehnen, one mile up the river, where good covered approaches existed and there were good shore lines on both sides. No artillery preparation was contemplated; however, a total of two battalions was available to deliver counterbattery and defensive fires on call. In addition, six towed 3-inch guns were ready to give direct fire support after daylight, and the chemical smoke generator company was ready to "smoke" the river and cover the reinforcement of the attack and the evacuation of the wounded. Boats were to be manned by engineers. The assault force was to comprise the 2d Cavalry Reconnaissance Squadron (less Troops C and E and Company F), with Company C 285th Engineer (C) Battalion attached.

The crossing was started at 0100, February 19. One platoon of engineers led and, upon landing, outposted the beaching site. The remainder of the attacking force followed, and the crossing was completed by 0300. Complete surprise had been effected, and no enemy resistance was encountered until the movement toward Wincheringen began. The force then received small-arms, mortar and artillery fire, the latter being generally ineffective as it fell north of the crossing site. By daylight, the hills west and south of the town had been seized and the western end of the town captured. Fighting continued through the day, and attempts of the enemy to relieve the town were broken up by artillery concentrations and direct 3-inch gun fire. At 1730 a final attack was launched to clear the town. At 1800 leading elements of the 10th Armored Division arrived and supported the assault and by 1900 hours the town had been successfully cleared.



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The 38th Cavalry Reconnaissance Squadron

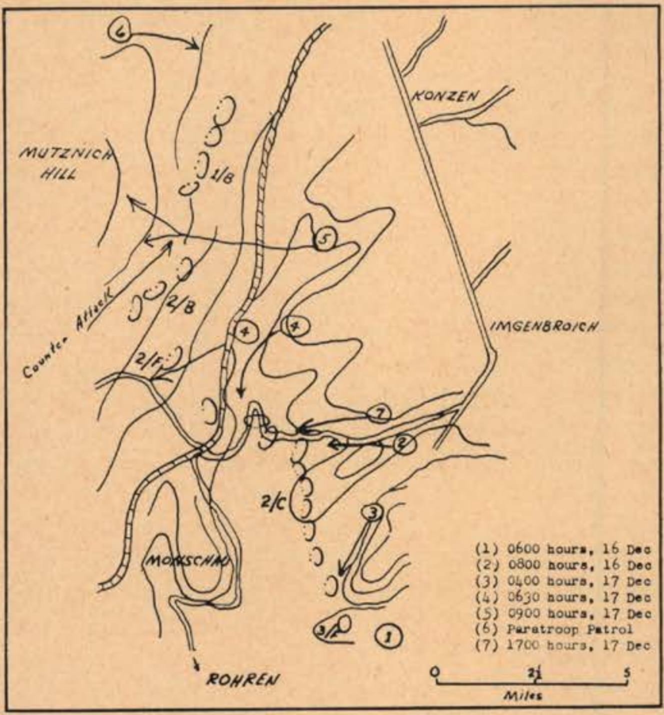
Defense of the Monchau area against German attack, December 16-17, 1944.

ON November 10, 1944, the 38th Cavalry Reconnaissance Squadron, under control of the 102d Cavalry Group, took over the defense of a sector of the V Corps' front which faced the Siegfried Line in the vicinity of Monchau. The sector was of particular importance because it guarded the approach to a network of roads which led to Eupen and Liege. On December 16, 1944, the squadron was disposed with cavalry reconnaissance troops C, B, and A abreast. Troop C was reinforced by a section of the 3d Platoon of Company F, while the 2d Platoon of Company F covered the 500-yard gap between Troops C and B. Troop A was in contact with the 102d Cavalry Reconnaissance Squadron, on the left, and Company F, less detachments, was in Monchau. The squadron had in support, besides Troop E, the 62d Field Artillery Battalion and two medium field artillery battalions.

Early December 16, German infantry struck this position, and made seven attacks during that day and the next. These attacks, which comprised the northern effort of the German winter offensive, were, except for the fifth attack, broken up by defensive fires. After the second attack the squadron commander asked group for reinforcements, and Company A, 146th Engineer (C) Battalion, and six machine-gun crews from the 186th Field Artillery Battalion were sent forward. Troops C and B were each reinforced with a platoon of engineers, and the engineer company (less two platoons) was placed in squadron reserve on the high ground just west of Monchau. The six machine-gun crews were placed in support of the tank platoon in the center. There was considerable activity on both sides during the night of December 16-17.

At 0900 hours, December 17, a fifth attack, made between the 1st and 2d platoons of Troop B on Mutznich Hill (see sketch), broke through the position on a front of 200 yards and overran three artillery observation posts. The squadron commander sent a platoon of engineers and a section of light tanks to Troop B's support, and with these units and the 2d Platoon of Troop B, a counterattack was launched and the enemy driven from his forward position.

During the height of this action, the squadron commander had called upon the group commander for additional reinforcements, and at 1100 hours, Company A, 47th Armored Infantry Battalion and one platoon of Company A, 10th Tank Battalion, were dispatched to the squadron. Arriving at about 1200, the infantry company was directed to patrol the woods in the rear of Troop B's position and the tank platoon was ordered into squadron reserve. During this time, about 20 enemy planes, one of which was shot down, strafed the squadron's position. At 1700, the 47th Infantry Regiment of the 9th Infantry Division closed into the area just west of Monchau. The following morning, December 18, this regiment relieved the 38th Cavalry Reconnaissance Squadron in that part of its sector which was occupied by Troop C.



The outstanding success of the 38th Cavalry Reconnaissance Squadron in defending its vital sector against repeated enemy attacks is felt to have been mainly the result of excellent organization of the ground, including very thorough laying of mines; installation of warning devices and erection of wire; very careful sighting of weapons and utilization of terrain; well-planned and effective supporting fires; excellent communications; and a determination to hold the position.

* * * *

The 87th Cavalry Reconnaissance Squadron

Attack against Meinkenbracht, April 12, 1945.

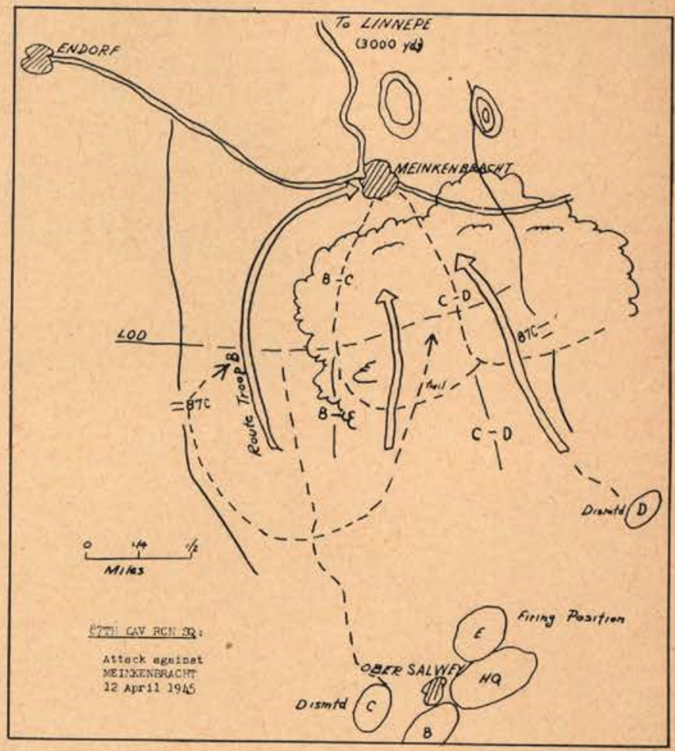
ON April 11, 1945, the 87th Cavalry Reconnaissance Squadron, of the 7th Armored Division, then in the vicinity of Landbeck, was ordered to capture Meinkenbracht and reconnoiter the routes: Meinkenbracht-Erndorf, and of Meinkenbracht-Linnepe. The attack was part of the mopping up operation by the 7th Armored Division in the Ruhr pocket.

The squadron's plans called for Troops B, C, and D, each with one platoon of Company F attached, to advance dismounted through the woods and assault the town. Each troop was to operate in the zones shown on the sketch, and Troop E was to support the attack from the position indicated. The final assault on the town was to be made from the south by Troop C, while Troop D was to cut the main approach route from the west, take the high ground southwest of town, and join the Troop C attack on squadron order. The 434th Armored Field Artillery Battalion was in direct support.

At 0600, April 12, the leading elements of the troops moved to the designated forward assembly area in the vicinity of Ober Salwey, where the reconnaissance troops—who were to be accompanied by tanks—dismounted and prepared to go forward on foot. Squadron headquarters was set up just east of Ober Salwey, while Troop E went into position as shown on the sketch. Troop A at this time was attached to Combat Command R on a separate mission.

As the reconnaissance troops pushed through the woods, the 434th Armored Field Artillery Battalion and Troop E fired artillery preparations on the town. Troop B, which had the least trouble with the terrain and met little resistance, pushed rapidly ahead of Troops C and D. Taking advantage of this fact, the squadron commander ordered Troop B into the town ahead of Troop C. This maneuver was accomplished with little loss to the attacking forces, and the speed of the attack resulted in the capture of 581 prisoners and a complete collapse of the defenses of the town. Troop B, moving rapidly through the town, pushed reconnaissance to Erndorf and Linnepe and found them occupied by the enemy. Troops C and D continued to advance to their zones and assembled at Meinkenbracht.

This action illustrates a rapid and successful dismounted assault by mechanized cavalry against a defended town. The rapid advance of Troop B was promptly exploited to accomplish the squadron's mission, and also reduced the enemy's pressure on Troops C and D, thereby decreasing the number of casualties which might have been suffered in those troops.



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The conclusion of the series of articles of which the above are a part, and which describe the employment of cavalry in combat in the European Theater, will appear in the next edition of the Armored Cavalry Journal. Remaining articles are:

86th CAVALRY RECONNAISSANCE SQUADRON

Attack against Meinkenbracht, April 12, 1945.

89th CAVALRY RECONNAISSANCE SQUADRON

Delaying action by Troops A, B, C and E, Befort area, December 16-25, 1944.

92d CAVALRY RECONNAISSANCE SQUADRON

Reconnaissance for the 12th Armored Division, Neustadt area, April 8-16, 1945.

80th CAVALRY RECONNAISSANCE TROOP

Reconnaissance during advance of the 80th Infantry Division to Kassel, April 1-3, 1945.

104th CAVALRY RECONNAISSANCE TROOP

Attack from Borgentreich area to Weser River in advance of the 104th Infantry Division, April 7, 1945.

Face-Lifting a Cavalry Squadron

*by Captain Kenneth T. Barnaby, Jr.**

THERE seems to exist in the Army an unpublished and unrecorded SOP which dictates: "No matter what the piece of equipment is, change it" . . . (for the better, of course). The 117th Cavalry Reconnaissance Squadron (Mecz.) was no exception. Some of the changes it made in matériel stuck with it. Others, while serving a specific purpose for a limited time, were later discarded. But all of them evidenced interest and ingenuity by the entire command. It was command's policy to encourage everyone to submit suggestions which would increase the efficiency and scope of the very excellent equipment with which we were supplied.

In one or two instances, the modifications were a combination of personal experience and theory, plus the experimentations of other outfits with which the squadron operated. In most cases the changes were strictly VOCO, VOCG, or field expedient. We felt especially grateful to the commanding generals of the VI Corps and the Seventh Army for their objective viewpoints in permitting us a latitude of liberal experimentation.

Brief Squadron History

The 117th went overseas in September, 1942, as the 2d Squadron, 102d Cavalry Regiment (Mecz.). The regiment landed at Liverpool, England, and moved to Southern England where it drew all new matériel in accordance with the then existing TO/E. In November, 1942, the 2d Squadron was assigned to Security Command, Allied Force Headquarters, and shortly thereafter sailed for Algiers, Algeria, where it assumed responsibility for the mobile security of General Eisenhower's headquarters, both forward and main. Some elements and officers of the squadron worked in Tunisia and Sicily during the campaigns in those areas.

In November, 1943, under the new TO/E for a cavalry squadron, the unit was reorganized and redesignated the 117th Cavalry Reconnaissance Squadron (Mecz.). The prescribed changes in personnel and matériel were made; three new troops, Headquarters, C and E were formed, and training was intensified.

In early 1944, the squadron was relieved of assignment to AFHQ, attached to the Fifth Army and after a short period moved to Italy where it received its baptism of fire as a unit when the Anzio beachhead burst from its besieged enclave. The 117th, with the Fifth Army, broke out of the Cassino-Terracina line and drove up the west coast of Italy. It was withdrawn from action after 39 days of combat, reassigned to the VI Corps of the Seventh Army, and prepared for the August 15 invasion of Southern France.

Landing with the advance elements of the invading divisions, the unit spearheaded the Butler Task Force up through Southern France and continued as the reconnaissance element for the VI Corps. It made contact with the Third Army at Darnay, France, and proceeded with the Seventh Army, breaking through the Siegfried Line, crossing the Rhine, and pushing southeast through Germany and Austria to the Italian border, where on VE Day it halted its march.

Two weeks later, at the request of General Eisenhower, the squadron was moved to Frankfurt A/M, Germany, to reassume the duties of mobile security for "Ike's" CP. It continued in this capacity until November 25, 1945, when it was officially deactivated.

Changes and Modifications of Equipment

Armored Cars, M8:

Because of the lack of armament on the bottom of the M8 armored cars, casualties were high among drivers and radio operators. To provide protection, a half-inch sheet of steel armor plate was laid on the floor of the driver's compartment from beneath the foot pedals rearward to behind the cushion seats, and from side to side over the drive shaft hump. This plate was welded at the sides and center. It proved invaluably effective, and no M8 or light tank was permitted to leave the squadron maintenance shop without it.

One of the troops which had suffered particularly from frontal AT fire experimented with sandbags stacked on the lower and upper slope plate on the front of the M8s as well as along the deck on either side of the driver and radio operator. A "lattice work" of thin steel sheets kept the bags in place on the front, and the weight of the bags held them firmly along the deck. The idea was similar to that used by some of the armored units on medium tanks. The result was not sat-

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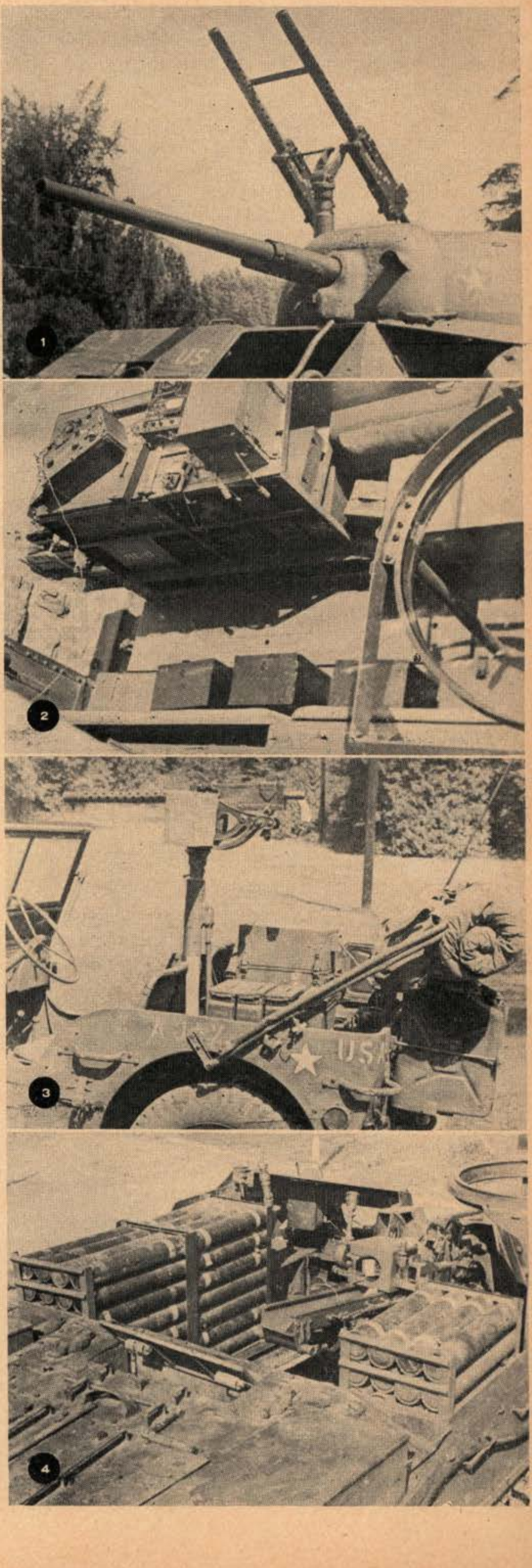
*Instructor, The Cavalry School.



1—Twin .30 caliber light machine guns mounted on the turret of an M8 Armored Car. 2—Bird's-eye view of the work bench installations in a half-track for radio maintenance. 3—Machine-gun jeep showing placement of extra ammunition boxes, modification of top bows, stowage of bed rolls and bags, and placement of 510 radio. 4—Rear view of gunner's compartment of M7 105mm Assault Gun showing ammunition stowage, and placement of grenades for demolition.

isfactory. While it gave additional protection to the crew, and had a beneficial morale effect, the resulting strain to axles, springs and shock absorbers, plus the general distortion of balance to the vehicle, caused abandonment of the idea.

One of the inefficiencies of the M8, it was felt, was that automatic fire could not be placed at close range on either side of the vehicle. A bow and turret gun would have been the solution. Experimentation with mounts for the bow gun was never completely satisfactory, and the stowage of ammunition was a problem never wholly solved.

Opinions differed on the caliber of the turret gun. One faction favored the .30, the other the .50 caliber. But both agreed on three fundamentals: That there should be a turret gun, that it should be mounted forward of the car commander's spot on the turret top, and that it should be mounted as low as possible. It was a foregone conclusion that the antiaircraft rôle of the gun was out. There was a third school of thought that favored twin .30 caliber MGs on the turret of the M8. As a result, the final decision—subject to the approval of the Troop CO—was left up to the individual car commander who, after all, was going to shoot the weapon. Each car, however, had a turret gun of one of the approved types. (See illustration No. 1.)

The actual mounting of either gun was not difficult. The turret mount from a salvaged tank, cut down and welded to the turret, served admirably, as did the M30 or M31 pedestal mount from a jeep. (In the latter case, though, it was advisable to be prepared with a reliable explanation if Ordnance caught you hacking up good equipment.)

The biggest advantage of the .30 over the .50 caliber was the bulk of the ammunition. This was quickly solved, however, by welding ammo box racks to the outside of the turret. The danger of enemy fire igniting the boxes was disregarded in favor of accessibility; and, as a matter of fact, no boxes were ever so ignited.

Two of the reconnaissance troops crashed through with twin .50 caliber MG mounts for use on the M20 Armored Car as CP protection. The ammunition was carried in racks which were welded to the side of the hull above the deck. This worked reasonably well, except that rapid rotation of the guns was somewhat difficult, and the weight of the double guns was a strain on the skate and ring.

The ring mount for the turret of the M8 Armored Car was not used by the members of the squadron. We preferred the stationary mount, as described above; but it should be pointed out that we did not have much opportunity to experiment or work with the authorized ring mount.

Half-tracks:

The squadron use of the half-tracks was somewhat varied. Squadron headquarters, assault gun and tank troops used them pretty much as per TO/E. The reconnaissance troops differed.

Troop C used them with the platoons—one as CP vehicle, and one with motor maintenance. This worked well.

Troops A and B thought them awkward and ungainly, unusable cross-country, and difficult to turn around in an emergency. There also was seldom enough personnel available to crew them properly. As a result they were used as follows:

Troop A: one as a troop CP vehicle; one as a troop supply vehicle; one as a motor maintenance vehicle fitted with welder, compressor, work benches, etc.; one as a general purpose vehicle for hauling ammunition to the platoons and for general drayage.

Troop B: one as a troop CP vehicle; one as radio maintenance vehicle fitted with work benches, tool racks, etc., for rear and emergency repair work (See illustration Number 2.); one as a motor maintenance vehicle fitted with work bench, welder, compressor, etc.; one to carry the one 81mm mortar and ammunition, and two barrack bags per section containing extra clothing for the personnel in excess of that which was carried on their vehicles.

The ¼-ton, 4x4 (jeep):

All jeeps were sandbagged at the front and back. This reduced the speed and shortened the life of the vehicle but gave it protection against mines.

One of the biggest problems with jeeps is the stowage of personal luggage in such a manner that room will be left for the necessary fighting equipment. Some units welded cages or racks onto the rear, others strapped the bedrolls and musette bags on the hood. In our case, we modified the top bows so that they did not lie flat around the rear body when collapsed, but hung about six inches above the rear tire and spare gas cans. The holding device, normally located on the outside of the body just back from the doorway, was moved to the rear about 15 inches and set at an angle. When the forward ends of the bows were set in the holding clamp, they hung high. The three musette bags were hung on the top of the bows, and bedrolls strapped either before or behind them. Thus the interior of the vehicle was left free from personal gear. (See illustration No. 3.)

In the machine-gun jeeps, the ammunition boxes were stowed along the left wheel housing and on the sandbags on the floor of the back seat, their weight holding them in place. A strip of angle iron along the inside edge of the wheel housing kept the boxes from slipping off.

The 60mm mortar jeeps (we had nine 60s per troop and an 81mm in addition) carried the mortar lashed by straps and D rings to a wooden block on the left rear wheel housing. The sight was carried in the glove compartment.

Ammunition was carried in a box which was built into the rear end of the jeep and replaced the rear seat. Although large enough to carry 85 rounds, the normal load was 60. The seat padding was removed from the regular seat and fastened to the top of the box cover.

Each mortar jeep was equipped with a .30 caliber MG which was mounted on the extreme right edge of the dashboard.

The skyhook or wire cutter was mounted on the front bumper of all jeeps.

ASSAULT GUNS (105MM HOWITZER, M7)

The squadron was extremely fortunate to have been authorized 105mm Howitzers, M7, in lieu of the M8 Assault Gun just prior to the invasion of Southern France. The advantages are obvious and do not need discussion here. In our opinion, they are mandatory for a cavalry squadron.

The 105s were used in battery, indirect, except on the rare occasions when a troop was detached from squadron control. Only once were they used in direct fire, when they were employed from a hull defilade position from a high hill, and fired down on enemy vehicles on a highway.

Modification of this piece was limited to ammunition towage. Racks of angle iron were constructed that were the length of the encased 105 shell. These were mounted on the sides of the gunner's compartment to replace those already installed. There were two racks on the left side and one on the right behind the antiaircraft ring. Each rack held 28 rounds and made the total carried by the vehicle 116 instead of the normal 69. (See illustration No. 4.)

RADIO AND COMMUNICATION

It is doubtful whether any two units in the entire United States Army ever had similar communication systems. Each adapted its equipment to the missions it received, or according to the pet theories of its responsible officers. It is reasonable to assume that one set-up worked as well as another.

In the 117th Cavalry, the major communication items of interest follow:

Each troop CP had a command half-track in which was installed a SCR 193 and a SCR 508. Each radio was equipped with remote control facilities so that radio rooms could be set up indoors.

Each troop in the squadron had a jeep in which was mounted a SCR 193. This provided long-range communication when personnel was dismounted, and carried the radio over "jeepable" terrain, which for one reason or another was impassable for armored cars or half-tracks.

We were extremely fortunate in being able to draw enough extra radios to equip every jeep in the reconnaissance troops, except those noted above, with a SCR 510. This arrangement proved of immeasurable value, particularly during dismounted defensive operations when it gave each gun position communication with the entire troop line. The portable "back-pack," described in THE CAVALRY JOURNAL several years ago, was used by some of the platoons; others preferred the German "back-pack" with slight modifications.

The installation of the SCR 510 in the jeep is shown in illustration No. 3. In another instance, the men varied the procedure and installed the antenna on the outside of the vehicle. This was the only vehicle so arranged. The radio was mounted on the right rear wheel housing, the long axis of the set parallel with the axis of the car. This placed the controls to the front, where they were convenient for the car commander. The mount issued by the Signal Corps (FT-420 bracket) was discarded because it extended out into the interior and back, and took up too much room.

The antenna base was modified so that it fitted into the right tool box behind the rear wheel, where it was bolted to the outside of the vehicle. The tool box cover was removed. This kept the antenna mount on the inside of the car so that it could not be ripped off or damaged by trees or heavy brush. The battery pack for dismounted use was kept under the right front seat and was strapped to the bottom of the seat.

SOP FOR DEMOLITION

Every vehicle in the squadron was equipped for demolition. Thermite grenades were installed on or near the engine where they could be ignited when necessary. A thermite grenade was fastened near all gas tank caps, conveniently placed to be dropped in the tank. Three one-pound blocks of TNT were kept in vehicles with caps handily placed but safely wrapped. All similar type vehicles were equipped in an identical manner. All car crews were schooled in destruction of vehicles and equipment. Demolitions were put in place on crankcases, etc., when vehicles were used in defensive, static positions—just in case. (See illustration No. 4.)

CAMOUFLAGE

For operations in snow, armored cars and jeeps were whitewashed. Crews wore the white linings of their parkas, or mattress covers which had been cut like burnooses. In Africa, the squadrons' tanks were painted light tan and splotched with green to blend with the terrain.

Up until the last two or three months of the European campaign, the armored cars of the squadron were equipped with SCR 508s, and the old SCR 193 transmitter with the 312 receiver. This was done for a number of reasons. Primarily, it was a result of the initial issue of sets, which were SCR 193s, the SCR 506 not then being available. The operators were trained on the SCR 193, and the entire squadron was schooled in the use of these sets until they became thoroughly familiar with their capabilities and limitations. The installation of the SCR 193 required a rearrangement of the ammunition stowage within the vehicle, and after the new set-up was approved, it was considered superior to the old.

The SCR 506 became available to the squadron during an active phase of the war. At such a time, it was not believed advisable to take time out to substitute it for the SCR 193 and retrain operators since this would reduce the efficiency of the unit. Training, insofar as it was possible, however, was initiated on the SCR 506, and during the last few months of combat the M8s which came in as replacements and which were equipped with the SCR 506 were not changed.

AIR-GROUND LIAISON

One of the most interesting communication set-ups was the communication radio link with the observation cub planes. During the entire Continental phase of the war, the squadron had one or two L5s or cubs assigned or attached, and the benefits were many.

The planes were equipped with a SCR 610, and one channel was linked with channel 10 in every armored car in the squadron as well as with each troop CP. One cub was usually in the air. And when the reconnaissance platoon or section ran into trouble—since it was already in communication with the cub—it simply requested the cub to reconnoiter the area ahead and inform it of the situation. If the situation warranted artillery fire, the cub reported this to the platoon or section and suggested artillery fire. The cub would then request direct fire from "E" troop (which was on the same channel), and adjusted the fire until the objective was reduced.

At the conclusion of the fire, the platoon or section was all set to go, since it had been listening to the fire directions. It then moved on the objective, continuing its mission. Because the troop CPs were listening, the troop CO also was kept informed of the situation, and considerable time was saved by avoiding delay, requesting permission, and repetitions.

Priority was set for missions of the cub by a policy of "first come, first served"; or, in case missions conflicted, by the tactical situation; and finally, if conflict still existed, by squadron or by the plane itself. Often the cub was able to cover two missions simultaneously.

When the cub took off from either the squadron strip (any field close to the CP) or the corps' field, squadron notified all troops to contact it. This word was passed down to platoon and in turn to the sections. Tight discipline was necessary on the net, which was a free net, but strangely enough, there was little or no confusion.

In addition to the above set-up, the plane was equipped with VHF radio communication to Corps HQ, where a flight of P47s stood by. If the cub sighted a target which required bombing or strafing (provided it had priority over other such missions) it notified the

P47s of the mission and when they arrived, indicated the target by diving, etc. The cub remained to watch the operation, and kept a weather eye open for other targets, or hostile aircraft.

Somewhat the same arrangement was in effect with "E" Troop. Each armored car and tank had one channel that linked it with the FDC of the 105s. Each troop CP was in this net. When a platoon or section ran into difficulty and required artillery support, it reported this to the troop CP. Clearance was secured either at the CP or from squadron. When permission was granted, the platoon or section contacted "E" direct, and requested and adjusted the fire. The troop CP merely monitored in order to keep abreast of the situation.

The platoon NCOs were trained in forward observation and probably directed as much artillery fire as the FOs sent up by the artillery troop.

An inestimable amount of time and trouble was eliminated by making it possible for the section or platoon to deal directly with the guns.

Each armored car and M20 was equipped with a SCR 508, and this made it possible to tie-in everyone with radio communication. The 10 push-buttons were broken down somewhat as follows: No. 1—squadron net, including all troop CPs and squadron rear. No. 2—A Troop net. No. 3—B Troop net. No. 4—C Troop net. No. 5—"E" Troop net. No. 6—F Company net. No. 7—1st platoon of each troop independently. No. 8—2d platoon of each troop independently. No. 9—3d platoon of each troop independently. No. 10—air-ground liaison.

The arrangement made it possible for every armored car to talk with any other armored car in the squadron by merely pushing the corresponding button. It reduced the necessity for changing frequencies when attaching tank platoons or other platoons to each other. It meant a variety of channels for communication with all other stations, and when a section was operating separately, it meant that it always had direct radio communication with either the troop CPs or squadron. It gave direct communication with cubs and assault guns, and with flanking units within the squadron. It made possible a quick and efficient relaying of information over long distances. It gave range and great flexibility to every large set.

SUPPLY

Rations:

When possible, hot meals were served the platoons. In Headquarters and AG troop this was not difficult, but in the reconnaissance troops the problem was more complicated. When they could, the platoons sent a jeep to the troop CP, and the kitchen supplied each man with his meal in hot food containers; coffee was sent up in five-gallon water cans wrapped with heavy paper and burlap. Sometimes the food was carried for several hours before there was an opportunity to eat it. If the platoons could not spare a jeep, sometimes the troop CP M20 or M8 took the food to them.

Each armored car in the reconnaissance platoons and each two tanks in the tank troop carried a case of 10-in-1 rations to be eaten only on command of the troop CO. In one reconnaissance troop these rations were carried on the right front fender of the M8 in a rack made of angle iron.

The troop kitchen had on hand a full day C rations and occasionally a full day's 10-in-1 plus B rations.

The mess sergeant, who had a jeep, was encouraged to forage to fill-in the issue-meals with fresh vegetables and meats.

Tank platoons attached to the reconnaissance platoons usually were supplied with meals by the tank troop unless it was too difficult. This eliminated the necessity of constantly changing mess records and ration issue and was endorsed by the reconnaissance troop 60s and the tankers.

Fuel and ammunition:

Each reconnaissance troop had an armored trailer which was towed by the executive's M20 armored car and was kept at the troop CP. This trailer carried a full load of ammunition for the tanks attached to the troops. When the platoon with tanks attached went into action and there were indications of prolonged firing, the trailer was dispatched to the scene where it was readily available for immediate resupply of the tanks. At the same time, a call was sent back to Squadron S-4 for another supply of ammunition for the trailer. This method prevented the tanks from exhausting all their ammunition because before the trailers were emptied the S-4 truck had arrived with another load.

Each reconnaissance troop was given a 6x6 for transporting a base or fraction load of ammunition and gasoline in addition to its normal troop-supply load. It was realized that it was an infraction of safety regulations to carry gasoline and ammunition on the same truck, but even so the convenience of having extra fuel and ammunition handy was worth the risk. Incidentally, not one truck was ever lost or hit.

Under normal conditions, the troop CP was supplied daily by S-4, and the ammunition and gasoline was carried by the troop 6x6. When the platoons began to run low on gasoline, ammunition or oil, they were supplied from the extra 6x6 either directly, if feasible, or by sending the supply forward in a half-track. The value, convenience and efficiency of this arrangement is immediately apparent.

* * * *

Mechanized Cavalry Operations

CAMPAIGNS in Western Europe proved the doctrine of "sneaking and peeping" by reconnaissance units to be unsound. Cavalry units had to fight to obtain information. Organization and equipment of mechanized cavalry based solely on requirements for reconnaissance missions was proved to be equally unsound. Both cavalry groups and squadrons were handicapped in the performance of their assigned missions because of lack of organic strength and firepower.

Mechanized cavalry accomplished the following assigned missions over the period covered by this report:

1. Dismounted attack of an important terrain feature.
2. Dismounted attack in a zone.
3. Seizing and holding a town or communications center.
4. Counter-reconnaissance, screening and blocking.
5. Filling a gap and maintaining contact between divisions, corps, and armies.
6. Pursuit.
7. Covering force and rear guard.
8. Defense of wide sectors of the Siegfried Line.
9. Reconnaissance in force.
10. Patrolling and mopping-up of an area.
11. Reconnaissance of routes and bridges including seizure and holding them.
12. Offensive operation in the enemy rear area.

Reinforcement of cavalry units with motorized infantry, tank destroyers, artillery, engineers and tanks was required for accomplishment of most combat missions. Such attachment permitted units to brush aside enemy resistance and push rapidly forward into enemy rear areas. Cavalry squadrons were the basic tactical unit. Vigorous patrolling of enemy positions convinced the enemy that our positions were held in force.

Assault gun troops were generally used in battery for indirect fire support and when artillery was available this unit was placed under the artillery commander for coordination of harassing and interdictory fires.

Mobility and speed made possible quick reduction of towns and villages by attack from the rear and by surprise.

Communication often was the key to success in moving rapidly, concentrating where resistance was weakest, by-passing heavy resistance, penetrating into rear area installations, cutting off routes of enemy withdrawal, preventing demolition of bridges, and close coordination and cooperation with fighter-bomber cover in reduction of strongpoints, neutralization of enemy armor, and scattering enemy units forming for counterattack. On August 31, 1944, when the VII Corps changed direction to the north, the 4th Cavalry Group filled the gap between First U. S. Army and Third U. S. Army, advanced on a wide front, captured Mezieres, established a bridgehead over the Meuse River, and saved a full infantry division to the corps for the decisive battle in the vicinity of Mons.

During the German counteroffensive, the 14th Cavalry Group fought a successful rear-guard action covering the enemy salient until the 7th Armored Division could be moved to that sector.

A definite need was demonstrated for the rifle trooper in cavalry organization and combat although there was no requirement for horses for mounting him. Cavalry retained its tactical importance and use, and the fact that horses were not required as a means of obtaining mobility and speed did not eliminate the necessity for troops to perform the cavalry mission. Lack of strength and firepower for combat necessitated battlefield improvisation.

The flexibility visualized in the group organization was not required; and the elimination of the regiment removed those elements of units, *esprit de corps,* history and morale which concern the preponderant part of the soldier's life, the importance of which cannot be minimized and which makes for the close association and cooperation required of cavalry on the battlefield.

A TROOP IN ATTACK

by Major James W. Cocke*

IN a daring mounted attack that utilized speed and cohesion, Troop B, 106th Cavalry, effectively employed its individual weapons to achieve surprise and reduce the strongly fortified town of Salzbach, Germany. The troop CO was Captain Tom Coolidge.

The area around Salzbach is a scarpland which borders the Main River on the east and is favorable for defense—if an attack comes from the west. A main belt of the Siegfried Line extends north and south through the town of Aschaffenburg, and runs parallel to the Main River which flows south to north through Salzbach, Obernau, and Aschaffenburg, which is the strongpoint in this area.

The 106th Cavalry Squadron, of the 106th Cavalry Group (Mecz.), at 0800 hours moved to precede the 45th Infantry Division in the division's zone (See Plate 1). The 106th Squadron then struck with speed, employing two troops abreast: Troop A on the right, or south; Troop B on the left, or north. Troop B moved swiftly to the east, advanced almost unopposed to Obernau on the Main River (Plate 1), and then quickly crossed the river south of Aschaffenburg near Obernau on a railroad bridge which had previously been found intact by the 187th Infantry Regiment of the 45th Infantry Division. The 45th Division, moving eastward, was to strike the stronghold of Aschaffenburg from the west.

It was reported to the commanding officer of Troop B that friendly patrols from the 45th Infantry Division were on the high ground to the northeast of Salzbach, but that the town itself was held by enemy of undetermined strength. Orders were received from the 106th Squadron that when the troop arrived at Obernau, it was to continue reconnaissance to the south in the direction of Salzbach. Upon arrival at Obernau, the troop commander decided to determine the enemy strength and dispositions in Salzbach by sending a dismounted patrol on reconnaissance along the railroad tracks (See Plate 2). Two light tanks (M24s) were to go through the orchard on the left of the road into "Hull Defilade," from which position they could cover by fire the movement of the patrol. Two assault guns (M8s) from Troop E were laid and adjusted on the railroad station and the western edge of Salzbach, and were to deliver fire on call of the patrol.

The dismounted patrol moved out from Obernau at about 1400 (Route shown on Plate 2), and was followed in 10 minutes by the tanks which took position in the forward edge of the orchard, as planned. The tank commander spotted a roadblock and some dismounted enemy near the edge of town. The tanks immediately opened fire at a range of 1,500 yards. The enemy near the roadblock scattered, and some fled into the woods southeast of Salzbach (See Plate 2). The tanks continued firing and demolished the roadblock. No self-propelled or antitank fire came from the enemy position; however, five minutes later enemy artillery fire, which apparently came from southeast of the town, began falling in the orchard very near the tanks. The tanks withdrew farther into the orchard to be out of enemy observation. The dismounted patrol, which now was moving along the railroad track, drew small-arms fire from near the railroad station. The patrol estimated the number of enemy at between 10 and 12 men. It withdrew under covering fire from the assault guns and reported to the troop commander.

After a consideration of the reports, the troop and squadron commander decided to make a mounted attack on Salzbach. When the tanks and assault gun observers left the orchard to return to Obernau, an enemy artillery concentration wounded several men. The town was not believed, however, to be strongly held and, since the tanks had received no antitank fire, it was felt that a rapid advance to Salzbach could be made without losses of vehicles.

The Troop B commander ordered the following order of march: Lead with two light tanks (M24s), followed by one half-track, three armored cars, one half-track, three armored cars, two more light tanks (M24s) and another half-track. As soon as the town had been secured by the assault force, the remaining troop vehicles were to be brought into the town. It was believed that more protection against enemy small-arms and artillery fire could be gained by placing all dismounted men in the armored vehicles. At this time, enemy artillery fire began falling on the road between Obernau and Salzbach.

All vehicles were stripped of gas cans and extra equipment and all automatic weapons were carefully checked. Each half-track was loaded with about seven men and the following arms: two light machine guns, two Thompson submachine guns, five rifles, and grenades. As the men in the half-tracks entered the town they were to fire on all suspected or observed enemy positions. This mounted force was to continue through the town, then dismount, reorganize quickly, and re-

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*Instructor, The Cavalry School. Former CO, Troop B, 106th Cavalry Squadron.

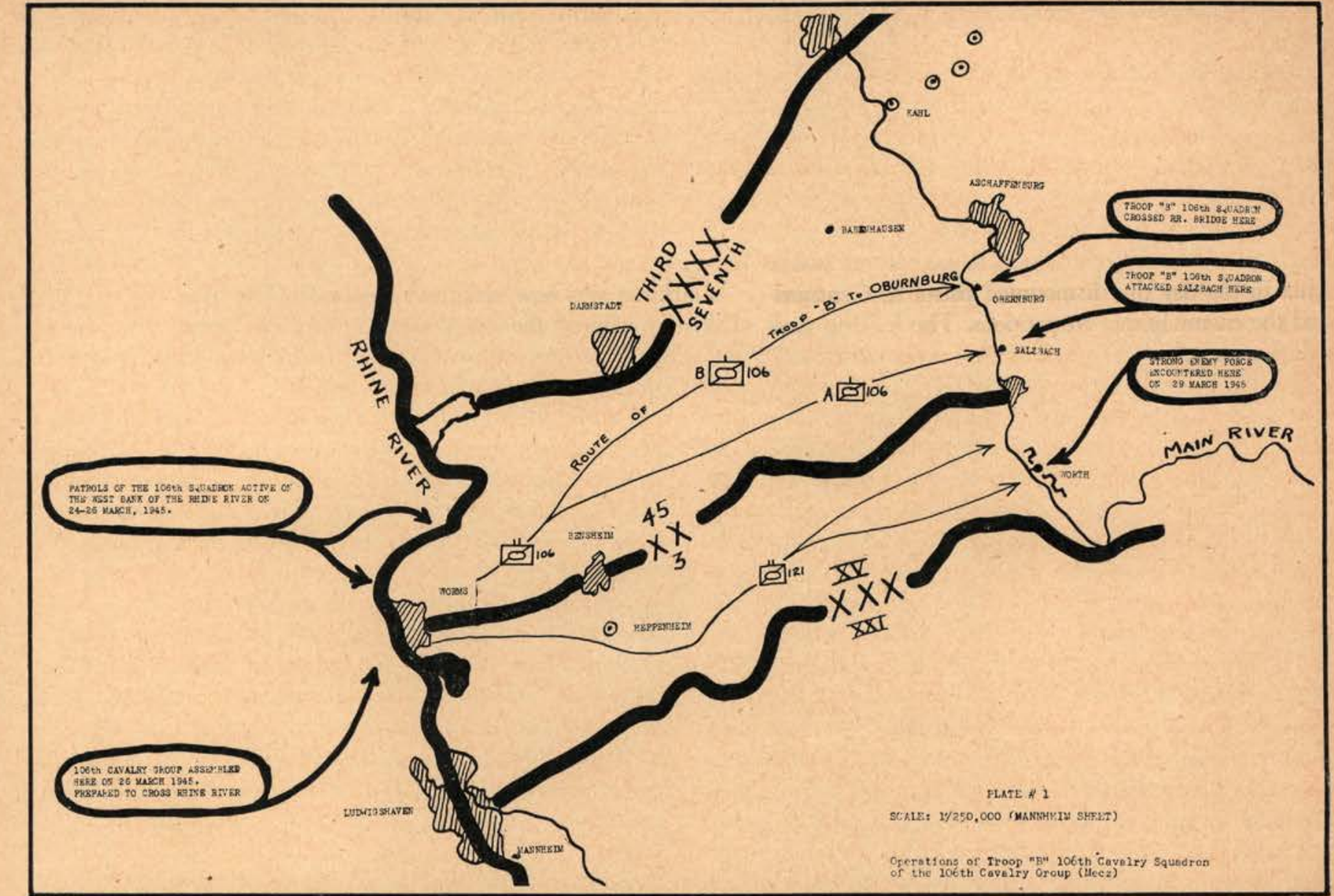
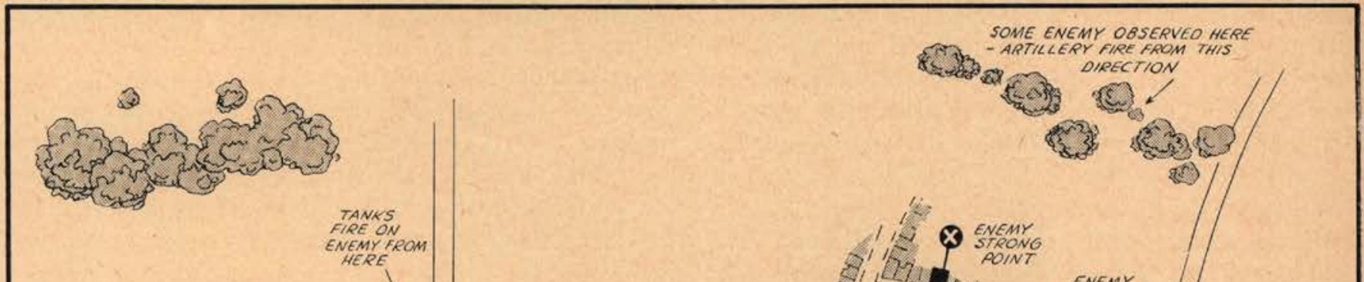

KAHL
ASCHAFFENBURG
BABENHAUSEN
TROOP "B" 106th SQUADRON CROSSED RR. BRIDGE HERE
TROOP "B" 106th SQUADRON ATTACKED SALZBACH HERE
STRONG ENEMY FORCE ENCOUNTERED HERE ON 29 MARCH 1945
OBERNBURG
SALZBACH
WORTH
MAIN RIVER
THIRD
XXXX
SEVENTH
DARMSTADT
ROUTE OF TROOP "B" TO OBURNBURG
B 106
A 106
RHINE RIVER
PATROLS OF THE 106th SQUADRON ACTIVE ON THE WEST BANK OF THE RHINE RIVER ON 24-26 MARCH, 1945.
106
BENSHEIM
45
XX
3
WORMS
121
XV
XXX
XXI
HEPPENHEIM
106th CAVALRY GROUP ASSEMBLED HERE ON 26 MARCH 1945. PREPARED TO CROSS RHINE RIVER
LUDWIGSHAVEN
MANNHEIM

PLATE # 1

SCALE: 1/250,000 (MANNHEIM SHEET)

Operations of Troop "B" 106th Cavalry Squadron
of the 106th Cavalry Group (Mecz)


SOME ENEMY OBSERVED HERE - ARTILLERY FIRE FROM THIS DIRECTION
TANKS FIRE ON ENEMY FROM HERE
ORCHARD
ENEMY STRONG POINT
ENEMY BAZOOKA K.O. LEADING M-24 TANK HERE
ENEMY ROAD BLOCK ON THIS RISE DEFENDED BY DISMOUNTED ENEMY
SALZBACH - CITY SQUARE
ROUTE OF ATTACK
ROUTE OF DISMOUNTED PATROL
OBERNAU
R.R. STATION
PATROL FIRED ON FROM HERE
ENEMY SCHOOL BUILDING -80 PRIS.
ENEMY STRONG POINT
MAIN RIVER
SKETCH - NOT TO SCALE
APPROX. 1200 YDS.
N

Operations of Troop "B" 106th Cavalry
Squadron from the towns of OBERNAU to
and including the town of SALZBACH.

PLATE # 2

duce any resistance which might remain in the buildings.

The attack jumped off at 1600 hours. The column moved slowly through Obernau to its eastern edge, then quickly increased its speed and advanced rapidly across the open ground toward Salzbach. No enemy artillery fire fell on the column, and the two miles were covered in a few minutes. Intensive concentrations of small-arms fire were laid on the railroad station where earlier in the day the dismounted patrol had encountered the enemy in dug-in positions. The leading tank pushed aside what remained of the enemy roadblock and continued into the town, followed closely by the remainder of the column. Some small-arms fire was received from windows but was quickly neutralized by the automatic weapons fire from the half-tracks. The leading tank was fired upon by a *Panzerfaust*, apparently located in a basement near a school building. The troop commander ordered the leading half-track to pass the tank and neutralize the *Panzerfaust* position. As the half-track started around the tank it was fired upon by the *Panzerfaust* team which almost scored several hits before they were driven to cover by automatic weapons fire which was sent from the half-track. The half-track then continued through the town, but as the tank started forward again a direct hit on the turret killed the tank commander and wounded the gunner. The rest of the column continued past the spot, but were fired upon by the *Panzerfaust* team before the position was finally neutralized.

The troop arrived at the town square shortly thereafter and immediately organized dismounted parties to clear up remaining pockets of resistance. The 3d Platoon took the southern and eastern section of the town; the 2d Platoon the northern section; the western half was cleared by one section of the 1st Platoon.

One light tank and the two remaining sections of the 1st Platoon took the school building under fire from close range. When the dismounted party moved toward the building, the enemy hurled grenades which caused five casualties.

The armored car, which was outposting the town to the southeast, was harassed by enemy small-arms fire from about six or eight dug-in enemy, who in turn were kept under fire by the armored car's light machine gun. The position was finally neutralized with the aid of some dismounted men, who took 10 prisoners. The troop commander ordered the remainder of the troop, which was still in Obernau, forward to assist in the house-to-house search. When it arrived and began this task, about 80 enemy came from the school building and surrendered. A few minutes later the enemy placed a 10-minute, ineffective artillery concentration on Salzbach. A total of 150 prisoners were taken during the mopping-up phase. An undetermined number of enemy were killed and a few escaped into the woods to the east.

The situation quieted down after Troop B had organized its position for the night. Just about dark, however, one of the ¼-ton patrols was fired upon by enemy that were still in one of the houses, and two men were wounded. A dismounted party from Troop B was sent to reduce the resistance. The fight lasted only a few minutes, and after an exchange of grenades about 13 enemy surrendered. In the confusion attendant with searching the prisoners five of them escaped.

Darkness was now near, and elements of the 45th Division relieved the troop about 2300. The troop was then assembled, and on squadron order prepared for movement to the northeast.

The final objective of Troop B in the attack on Salzbach was not the houses or streets but strategic points such as railroad stations, telephone exchanges or other public utilities. Troop B attacked straight through the town to seize the important road junction, the schoolhouse and the pillboxes on the outskirts. The railroad was strongly defended by the enemy, which made it necessary to concentrate fire on that position. In this action it has been shown why all houses must be treated as "inferior" pillboxes: because most of them had basements from which the enemy had to be flushed by house-to-house action. Basements are favorable to the defender, as evidenced by the work of the *Panzerfaust* team which succeeded in knocking out the light tank.

Another point that should be noted is that buildings obscure visibility, which is further restricted by dust from the impact of projectiles or explosive charges. The point or origin of fire is very hard to locate because the report is drowned by the noise of the impact of the projectile, and because of the many points from which fire can be delivered even from a relatively small area.

Control is another facility of extreme importance in such an action. In no other form of combat, except in dense jungles, is observation as restricted as in village fighting. This condition makes centralized control by the troop commander very difficult. The small unit commander must therefore use every ounce of initiative and aggressiveness he possesses, because most of the action will be under the direction of small unit commanders. An example of this was the assignment of sections of the town to each of the platoons.

The neutralization of hostile fires is also of paramount importance. Most of the machine guns were well forward, as evidenced by the numbers and kinds of weapons used by the troops in the half-tracks. The troop commander utilized his weapons to the utmost when he directed the fire of all automatic and small arms at the railroad station, and at the known enemy positions in the windows of the town. Heavy concentrations of small-arms fire were directed at the enemy *Panzerfaust* position.

All the important points mentioned above are principles of doctrine laid down in FM 31-50, Attack of a Fortified Position and Combat in Towns.

Tanks and Infantry In Northern Luzon

CARDED

Submitted by Captain Peter Marusek,
775th Tank Battalion, in a Training Memorandum

The notes on which this story is based were taken when we fought the Japanese in the mountainous terrain of Northern Luzon. Secrecy requirements prohibited their publication until now. It is interesting to observe that all of the points set down are now covered in regulations.

THESE notes are based on the combat experiences of the 775th Tank Battalion in operations in the Northern Luzon area from January through June, 1945, and are designed as a guide for future operations under the same terrain conditions. During this campaign, it was the usual thing to be confronted by situations for which there was no immediately obvious solution. A method of action could be devised to solve the problem in most cases, however, by the application of common sense. A thorough understanding between the Tank and Infantry team is a prime necessity if success is to be attained.

TERRAIN AND WEATHER CONDITIONS

Tanks were not primarily designed to operate in mountainous terrain, but notwithstanding their limitations in such terrain, they can be employed against the enemy with great and unexpected success. In spite of losing mobility and maneuverability, tanks in rugged areas gain a tremendous element of surprise and shock action.

In Northern Luzon the majority of roads are secondary, and are bordered by sheer cliffs rising or dropping abruptly from the shoulders of the roads. The roads twist sharply upgrade and downgrade, and usually follow the course of the winding rivers and streams, or circle around the sides of mountain ranges. During the rainy season, the shoulders of the roads cave away, and numerous landslides are encountered. The roads in most cases are wide enough to permit tanks to turn about, but it required four or five motions to complete such a maneuver. In many instances, bulldozers blazed a trail to enable the tanks to support the infantry by direct close-range fire from positions high atop mountains and cliffs. It was almost always impractical to assume covered or alternate firing positions.

ASSIGNMENT OF TANKS

In mountainous terrain, the employment of tanks in mass is impractical. The supply and maintenance problem requires that the tank units be assigned properly. The tank battalion is a normal unit of employment for an infantry division; the tank company for an infantry regiment; and the tank platoon for an infantry battalion. Any further breakdown is not feasible, but if the situation demands it, a tank company and even a tank platoon may be attached to an infantry division. For normal employment with the division reconnaissance troop, the light tank company should be under the direct control of division headquarters.

SURPRISE

Impassable or difficult terrain can be used to a great advantage to effect an element of surprise. In such areas, organized antitank measures are usually lacking, but hasty mine fields can be expected. The enemy had a tendency to underestimate the capabilities of our tanks under these conditions and as a last resort he employed suicidal and ambush tactics to correct his mistake. It was a wise plan not to underestimate his cunning.

USE OF THE MEDIUM TANK M4

The medium tank proved more suitable than the light tank for the close support of ground troops in severe mountainous terrain. Its slow speed enabled the infantry to follow easily, and its armor and fire power enabled it to close with and neutralize or destroy the enemy. It was used extensively to lead the attack while supported closely by infantry; to support by direct fire the advance of ground troops; to accompany and assist the advance of the infantry; and, in a few instances, to supplement artillery and to feel out the enemy's defenses.

USE OF THE LIGHT TANK M5A1

The light tank was found to be poorly suited for operations in mountainous terrain because of its lack of fire power and armor, and the loss of speed and maneuverability. The light tank with tank-borne infantry, however, was used satisfactorily to patrol and protect supply and communication lines; on reconnaissance and security missions around coastal plains and flanks;

and as a fast, maneuvering force to attack the enemy's flank.

Reconnaissance

The most effective means of reconnaissance in mountainous terrain was the liaison plane. Large areas that are difficult to traverse on foot can be reconnoitered quickly and effectively by plane for every possible tank approach or firing position. Every available means must be utilized to reconnoiter areas thoroughly prior to any contemplated action. Ground reconnaissance is always continuous and very important. When terrain will permit employment of only a single tank or tank section, dismounted reconnaissance is essential in selecting gun positions, and a route thereto.

Security—Assembly or Rear Areas

Tank units are responsible for their own security in the assembly area. The bivouac should be located close or adjacent to other units and the tanks should coördinate with them in the defense of the area against enemy infiltration or attack. Tanks should be placed in a circular arrangement at close intervals (five yards) with all thin-skinned vehicles in the center of the perimeter. Dismounted machine-gun outposts should be provided around the outer perimeter.

Extremely dense wooded areas should be avoided in selecting bivouac areas. When our forces have control of the air, concealment from air may be disregarded, but cover and concealment from ground observation must always be sought.

Tanks have no security while returning from the forward area and are very susceptible to ambushes and suicide attacks, and for that reason they must be released early enough to return to the assembly area before darkness. It is also imperative that sufficient time is allowed to resupply and maintain the tanks if they are to be employed the following day. In some instances it is advisable, if circumstances permit, to carry tank-borne infantry for security while returning to an assembly area over dangerous "ambush" terrain.

Security—Attack Position or Forward Area

Because of the conditions of the roads, or, as often, when tank units were compelled to operate until darkness, it was necessary to bivouac the tanks in the forward area. Under these circumstances, infantry commanders should provide adequate and complete security for tank units, whether company size or smaller. During the night, tanks should be pulled back to the forward infantry command post and placed inside the infantry perimeter. Because tanks draw heavy enemy mortar and artillery fire when they are in the forward area, the bivouac selected should have excellent cover.

Tanks normally should never be used during the night as road blocks or outposts. If possible, an antitank gun should be used for such a mission, for it was especially designed for it and is more effective than the tank. In addition, the tank crew would be denied its rest, which is essential for the next day's operation. In emergency, when there is a distinct threat of an enemy armor attack and antitank guns are not available, tanks in conjunction with infantry may be used on road blocks during the night.

Advance Guard and Main Body

No matter on what type of terrain tanks and infantry are operating, an advance guard is a necessity if the advance of the main body is expected to be uninterrupted. This is especially true if the enemy employs a delaying action and offers only sporadic resistance.

The advance guard, composed of tanks, infantry and engineers, must be employed at a safe distance where it cannot be overwhelmed before assistance from the main body can reach it. The guard's mission will be to push back and destroy small enemy parties, reconnoiter fords across rivers and streams, and to remove or by-pass mine fields and obstacles.

The size of the advance guard varies with the tactical situation, and in mountainous terrain constitutes only a small fraction of the troops. The advance guard should preferably be commanded by the tank officer, who should be directly responsible only to the main body commander for the tactical conduct of his force.

When an advance guard is employed, the remaining tanks lead the main body. The enemy is likely to allow the advance guard to pass, and then attack the advancing column with his armor, or he may employ other offensive or harassing measures. It is not advisable to have tank-borne infantry on any leading tanks in any leading column.

Coöperation in Offensive Action

A thorough understanding between tank and infantry units is a prime necessity. Every possible effort should be made for coördinated teamwork between the two arms. Mutual capabilities must be understood, and tactical suggestions by either arm should be duly considered by the other arm.

Artillery and air support can be used effectively to keep the enemy occupied and off-balance during the attack. A diversive type of action should be used whenever possible. Mountainous terrain can be easily defended by the enemy, is very difficult to seize and occupy.

Tanks in almost all phases of attack usually draw intense artillery, mortar and small-arms fire. While the fragments from such fire do little or no damage to the tanks, the richochets can cause considerable casualties to the accompanying infantry if it is not properly dispersed and in a suitable formation. The accompanying infantry should remain close enough to see the tank clearly, and yet remain within good rifle and BAR range. A tank does not provide cover for the infantry from these ricochets. A lead tank can, however, be used without accompanying infantry, provided it can receive sufficient fire support from another tank, or is under cover of a mortar and small-arms concentration that will protect it from enemy suicidal antitank measures.

In mountainous terrain, tanks are, in almost all instances, restricted to movement on roads. The size of supporting tank units used in the attack will very seldom exceed one tank platoon. One section will be employed to lead or support the attack, while the other is held in reserve. It will usually be found that only two or three lead tanks or possibly one, can give direct fire support at one time to the infantry. Most of the time, the valleys or plateaus will offer an opportunity to employ more than one tank platoon. Every advantage should be taken of employing as many tanks at one time as the terrain permits, if the tactical situation warrants it.

In the event the terrain does not permit the use of two or more tanks, tanks for which there is close infantry protection can be used singly with good effect either as mobile or stationary pillboxes. When the enemy holds a strongly fortified entrenched position, it will be necessary to choose routes around the flanks over some usually "impassable" terrain to a high vantage point overlooking the enemy's defenses. Single tanks, if given infantry protection, can usually be placed in position where they can support by direct fire an infantry attack against a located enemy strongpoint. Tanks can be used with great success when employed as mobile or stationary pillboxes under the same existing conditions. It must always be remembered that direct tank fire is more effective than mortar or artillery fire against enemy strongpoints which are in prepared cave positions on hillsides.

ANTITANK MEASURES

When tanks operate on mountain roads that have overhanging banks they are very susceptible to attack by small enemy antitank groups. In such areas, enemy demolition squads armed with satchel charges, pole charges, thrust mines, or Molotov cocktails can frequently be expected. Overhanging banks generally provide excellent cover for an attacking squad which in most cases will be impossible to spot from the road. For this reason, it is necessary that the accompanying infantry scout out possible enemy positions atop the banks before tanks are sent below them. Many suicidal attacks also can be anticipated in almost every imaginable form, for the enemy has no regard for sacrificing lives to accomplish a special mission. And, without proper and alert infantry protection, tanks are vulnerable to such attacks.

The enemy can most of the time be expected to emplace artillery or antitank guns in caves, in draws, on a reverse slope, and occasionally in less suspected locations. He will nearly always defend passable tank terrain. Enemy gun positions will be thoroughly camouflaged, and frequently will have a very limited field of fire. The enemy's antitank discipline is excellent. Tanks usually will not be fired upon by antitank guns until they have closed to a very short range (40 to 200 yards).

Mine fields can always be looked for along roads. The mine field found was in many instances a hasty one, with no attempt by the enemy to camouflage or defend it. Organized mined areas can always be anticipated in tank approaches which lead to the enemy's main defenses, and most of them will be heavily defended by strong machine-gun emplacements. The tank gun can be used to clear hasty mine fields when they are detected, and are defended only by small-arms fire.

The enemy often formed road blocks by blowing roads away. When the entire roadbed was completely blown apart and no by-pass was available, this type of road block was highly successful, and was simple to effect. The enemy usually did not defend it.

Emplaced enemy tanks were found serving dual use as an antitank gun and a pillbox. They could generally be expected in mass, and heavily entrenched. The enemy avoided open tank action except on purely suicidal attempts.

The enemy many times set up strongly prepared ambush positions. These were located in densely wooded sectors of road and stream crossings that were likely avenues of armored approach, and were supported by antitank weapons and machine guns. Infantry troops, with tanks in position to support them by fire, should search out such spots. The infantry's reconnaissance should be preceded by an artillery preparation if possible.

When tanks move alone from one locale to another through wooded or mountainous terrain, local security should be established immediately when halts are made by one tank or the entire column.

TARGET DESIGNATION

Tanks are dependent to a great extent on the infantry to indicate enemy targets. A tank that is buttoned up is blind. A tank phone, colored smoke, radio, tracer or white phosphorus grenades should be used for target designation. Prearranged signals should be agreed upon between the infantry and tanks to simplify the procedure for target designation. Colored smoke signals should be changed daily. The enemy often confused our troops by using our smoke grenades.

TANK-INFANTRY COMMUNICATION

Without radio communication, tank-infantry coördination would be difficult to maintain. Each tank should be equipped with a field phone to supplement tank-infantry radio communications. From our experience to date, the most satisfactory tank-infantry communication arrangement is for every tank to have an AN/VRC-3 radio to supplement the SCR 508 series.

Experiments are being conducted on installing the SCR 694 in tanks to net with the SCR 536.

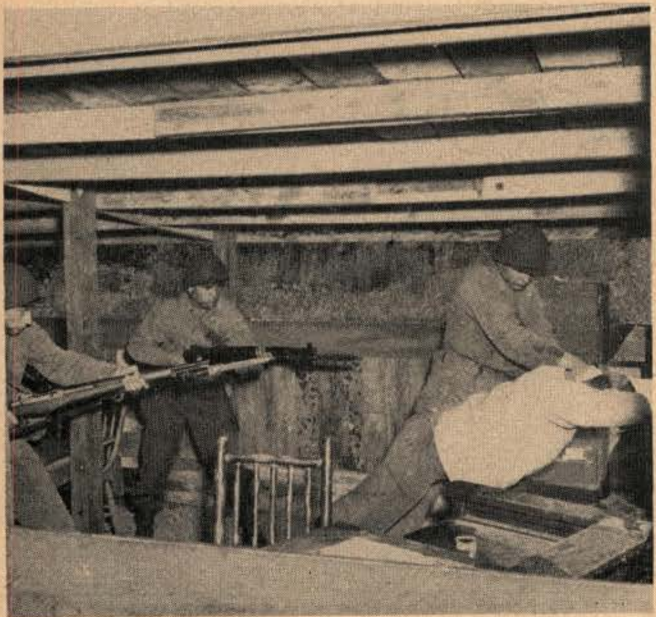
TRAINEE--1946

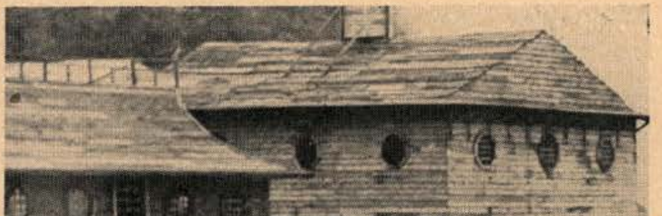
Prepared Under the Direction of the Commanding General, Replacement Training Center, Fort Knox, Kentucky

On April 1, 1946, the Armored Replacement Training Center officially became the "Replacement Training Center, Fort Knox, Kentucky." Actually it became the "Mounted Training Center" because to it are sent trainees for armored cavalry, field artillery and the cannon and antitank elements of infantry, all of whom are to serve in mounted units.

THIS article will present an orientation on the present mission of the RTC, and a prophecy for the future. By the time these lines are read, the organization and training policies of the postwar army may be more definitely known. Some of the predictions made here, therefore, may not be borne out.

A soldier enacts the part of a civilian as others undergo realistic training at Fort Knox for occupation duty.





Training for occupation duty is complete: here soldiers cover a searching party. Note Japanese "buildings."

Recruits may be turned into soldiers by either of two methods: at a training center prior to assignment to units—as has been the practice in wartime; or in recruit squads within their units, when assigned directly from reception centers or recruiting stations—as in peacetime. Obviously a unit in combat has neither the time

MODEL

nor facility to give basic training. Although both time and facilities for such training are available to all units now, it is not believed desirable for troops on occupation duty to be charged with the training of recruits. Further, in peacetime there is much to be said in all cases for the continuance of centralized basic training. Therefore we shall assume in the discussion which follows that the replacement training center is a permanent institution.

When the over-rapid demobilization of our overseas garrisons in early 1946 demanded a faster flow of replacements, basic training was cut from 17 weeks to its present 8 weeks. Although trainees are given branch instruction, specialization within branch is eliminated. Instruction is basic in a literal sense, although it has not been made branch immaterial.

The mission of the training center is to graduate a "basic" private who is capable of taking his place in a squad or crew of a combat unit of his branch that is engaged in occupation duty. The center does not train noncommissioned officers, leaders or specialists. It does train all men in squad or crew positions below that of leader. The qualifications of the graduate are more specifically, in the order of their priority, as follows:

A well-disciplined soldier.

A qualified marksman with the rifle (carbine for field artillery).

A qualified assistant driver of 2¼-ton truck and basic combat vehicle (qualified driver as far as practicable).

A qualified gun squad or crew member of his basic crew weapon (105mm, 90mm, 76mm, or 37mm gun) to include familiarization with duties of gunner.

Familiar with his T/O individual arm.

Familiar with the caliber .30 machine gun.

Familiar with the duties of a private on occupation; bayonet, tear gas, search of buildings and individuals, riot formations, traffic control, guard duty, etc.

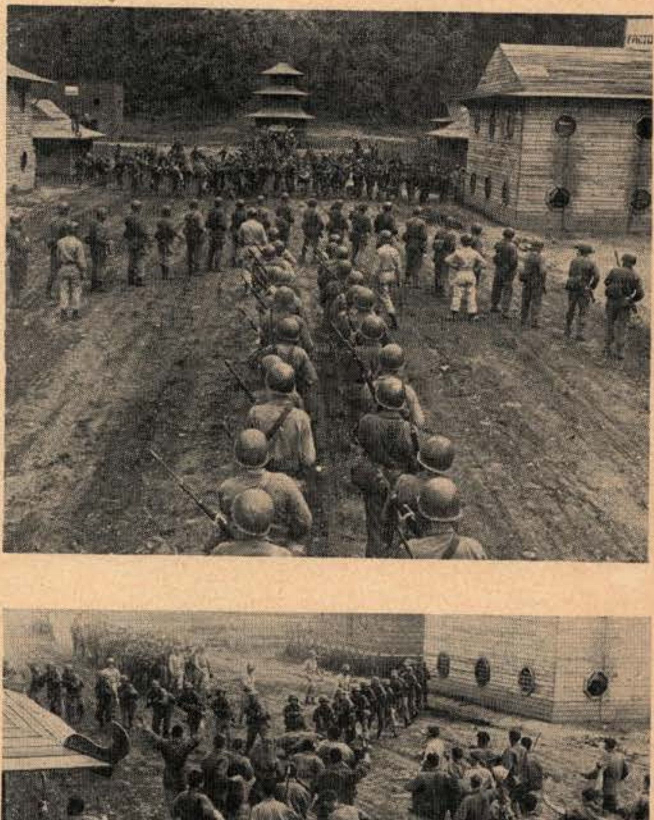
Familiar with simple field duties.

All familiarization courses include use of service ammunition.

It is believed from experience that the above qualifications can be achieved by the recruit in eight weeks. The commander in the field cannot expect an expert combat driver, a qualified gunner, a radio operator, a cook or a mechanic. Neither can he expect a hardened field soldier. But he can expect a good "basic" private—one whom he can, without hesitation, place in a combat squad.

At the Fort Knox center, armored cavalrymen are trained on the M4 tank with 76mm gun, or the armored car; infantrymen are trained on the M45 tank (cannon) or the M26 (antitank); and field artillerymen on the towed 105mm howitzer. Training methods are a combination of centralized and decentralized training, with the trend toward the latter. As the cadre percentage of regular army men increases and brings an increase in more capable instructors, it becomes more practicable to decentralize instruction and give increased attention to the individual trainee. The instruction of small groups means more "do" and less "talk," and results in turning out a trainee who has actually done it, not just seen it done—or, as the expression goes, has been "exposed to so much instruction."

The Training Center exists solely to serve the units



Above, a front and rear view of a problem as carried out at the Center which shows the 1946-trainee how to deal with a mob. The demonstration shows the effect of "the organized few" on the "disorganized many."

in the field. Suggestions from field commanders are therefore welcome. Suggestions to field commanders are:

Check to see that the trainee you get is in the type of unit for which he was trained. The man trained for a cannon company is not a rifleman—although he has qualified with the rifle. The mechanized cavalryman is not a tank driver—he is an armored car driver.

Check to see that the trainee's records include a "Form No. 1" which shows the subjects in which he has qualified.

Don't expect a specialist or a well-trained field soldier.

Do expect a well-disciplined "basic" private, who is perfectly capable of taking his place in a line gun squad or crew, who can drive his basic vehicle, and shoot his crew and individual weapon.

As an example of the current instruction being given to prepare a trainee for occupation duties, there follows a description of the course in Civil Affairs.

In keeping with the Center's mission, the Civil Affairs Committee prepares the recruit for service with units engaged in occupation duty by giving him an introduction to the duties he, as private, may expect to perform when he joins such a unit. In addition to familiar instruction he receives as a member of an infantry, artillery, or tank squad or crew, he takes part in an eight-hour course in the technique of seizure and search, traffic control, riot duty and other matters that daily confront the occupation soldier.

Training is conducted by the "country fair" system for groups which average less than 40 men. Emphasis is placed on the individual's participation in the training, and on the necessity for a soldierly bearing when dealing with civilian personnel in occupied countries.

A carefully rehearsed skit in which two soldiers search a "suspect" in his room opens the instruction in this subject. While the group looks on, the instructor keeps up a running commentary as the action unfolds. The soldiers enter the room, inform the "suspect" of the authority for the search, then search him for weapons. While one soldier guards him the other carefully searches the room and its furnishings, and uncovers weapons, explosives, contraband, and other suspicious items. These are listed for the suspected man's signature. Then, as the soldiers relax their vigilance, the "suspect" snaps out a concealed pistol, "killing" them both. In the critique this, and other planned mistakes, are discussed to drive home the necessity of care and caution in all searches. Trainees then practice guarding and searching each other for contraband which has been previously hidden by the instructor.

Following the skit, the instructor defines restraint and custody, and demonstrates the right and wrong way to approach, arrest, and control prisoners when using military weapons. This is followed by guarding arrested persons, during which the coach and pupil method is employed.

The class on traffic control includes the demonstration and practice of hand signals by a driver, coupled with correct daylight and night traffic control signals by an MP. When the group has learned these signals, it is divided into subgroups and at prepared street intersections each man practices controlling traffic as other recruits act as "vehicles" and approach the intersection.

A review of gas mask drill, and a test of the effectiveness of the mask against tear gas, opens the period on the use of chemical agents in riot duty. A discussion is given on the use of chemicals against mobs, which covers the methods of firing, tactical use, and physiological and psychological effects. This is followed by a problem in which smoke, tear gas, Adamsite, and white phosphorus are used, and in which recruits take part on the "sending" and "receiving" end. Each recruit throws one tear gas hand grenade during the instruction.

Bayonet training emphasizes the use of the weapon in riot duty rather than in battle. Artillerymen use the carbine bayonet, all others the rifle. It is assumed that guard duty in occupied areas will be conducted by personnel whose bayonets are fixed, and that police patrols bent on search, seizure and arrest will fix bayonets. A simple drill to meet this requirement is practiced. Fixed bayonets are carried in all civil affairs instruction except traffic control.

Squad and platoon riot drill is conducted with bayonets which are fixed and bared. Throughout the drill, emphasis is placed on precise movements, soldierly bearing, and a steady and determined manner in the execution of all formations. The object is to impress the recruit with the psychological effect that "the organized few" have on "the disorganized many." Instructions include the "when" of firing, the care and recovery of wounded, and the seizure and disposition of the key agitators in a mob. Recruits alternately take the part of both riot squad and mob.

For instruction in house-to-house seizure and search against armed resistance, the group is divided into five "waves" which are conducted on a "tactical" walk through the village. During the walk a picked team demonstrates as the instructor describes and explains the following: the organization of the wave into search and support parties; fire and movement; firing from a window; and the seizure and arrest of occupants and persons who resist. Each wave is then conducted through a similar course and required to negotiate the same obstacles and solve the same problems met by the demonstrating team. Concurrent with house-to-house search, instruction is given on methods and techniques of saboteurs, featuring likely targets such as power plants, industries, food supplies, communication lines, and military installations. A display of instruments and explosives which might be used is shown.

Organizations receiving replacements from this Center can expect that, in the foregoing aspects of occupation duty, a sound basis for additional training has been made by the Civil Affairs Committee.

ARTC's Contribution to Victory

by Captain Harold W. Keyser, Cavalry

THE power and striking force of the armored troops, which contributed heavily to victory in both theaters, can be traced in a large measure to the training provided by the Replacement Training Center at Fort Knox, Kentucky. This was the nation's only training center for replacements for the men who fought and directed the armored vehicles on the world's battlefronts.

Even before the war, the necessity for a definite training for the special troops required to handle the highly technical equipment of the Armored Forces had been recognized. The first steps toward the organization of a centralized training set-up for these men were taken in October, 1940. It was designed primarily to give basic training to filler replacements for the newly born and rapidly expanding Armored Force.

The Center embodied many innovations in training techniques, and encountered many of the same problems experienced by any new army training camp. Its original cadre was drawn from the 1st and 2d Armored divisions, and was supplemented by Regular Army and Reserve officers who were particularly qualified as instructors.

Operation was begun in the last week in February, 1941, when the first trainees arrived at the Center. The T/O at that time called for 36 companies of 220 trainees each, which were organized into battalions of three companies, and into Groups of four battalions.

Eleven weeks after the arrival of the first increment, the Center was handling the training of 5,431 enlisted men for duty with the existing armored units, and those in the process of formation.

Two phases made up the original training program: The initial phase, handled by the various companies under battalion supervision, and including all basic subjects; and the second phase comprising the more advanced technical subjects peculiar to the needs of the Armored Force. Upon completion of the latter, many of the enrollees went to the specialist schools in tank maintenance, communications, etc.

Because of the highly technical nature of the work involved in the operation of the Armored Force equipment, efforts were made to establish a minimum mental standard for trainees, and to obtain men with at least a high school education. The heavy demand for this type of man by other branches, particularly the Air Force, precluded the realization of this effort by the ARTC, but the results obtained with the men assigned were highly satisfactory.

A major problem during the early stages was the difficulty of obtaining necessary equipment for training. No tanks were available and the trainees were instructed in driving and gunnery on borrowed tanks. Only 10 to 12 tanks per day were available, and men were forced to wait a long time before their turn came for driving practice.

Major changes in the original training set-up were made during the summer of 1941. The training of auxiliary troops—such as armored, infantry, signal, quartermaster, medical, engineers, and ordnance—was taken over by the regularly established replacements centers in other parts of the country, and the ARTC began training armored units only.

To the original two Groups, a third was added in October, 1941, to train replacements for reconnaissance, assault gun and mortar companies.

An additional course was included in the operations of the Center in the fall of 1941 with the inauguration of the Officers' Orientation School. The purpose of the school was to introduce newly assigned officers to the tactics and technique of the Armored Force. Early sessions of the course were beset with difficulties as may be gathered from a request submitted by the G-3 of Armored Force to G-4 for one medium tank for exhibit to officers in the orientation course. The request stated, in substance . . . "It is not expected to give any driving or firing instruction, but the officers should at least see the medium tank, M3, prior to joining tactical units."

The first class of this orientation school was graduated in November, 1941, and the classes continued until February, 1943, by which time practically all newly assigned officers had armored force backgrounds and it was felt that the necessity for the school therefore no longer existed.

When the United States entered the war, 7,469 men were undergoing training at the Center on a 13-week basis. Speed was needed and the War Department ordered a reduction of the training time to 8 weeks. This plan was abandoned when it was determined that the quality of the training was materially reduced by the cut.

A material increase in the amount of training equipment soon made an advance in training efficiency possible. Field training was increased. Road marches were longer, and additional experience was given the men in entering and leaving bivouac areas after dark, as well as in night blackout driving.

In 1942, lessons gained in combat in Africa were applied. Increased time was given to the physical hardening of men, and more emphasis was placed on land navigation, mines, booby traps, and night operations. The number of specialist classes in the Center was reduced, and all trainees were required to complete the seven-week basic course before acceptance for specialists' training.

The committee method of training, with specialized teams of instructors handling instruction in the various technical subjects, was adopted by the Center.

By the end of 1943, the training program had been broken down into five major categories: 1. Subjects taught under company or battalion direction. 2. Small arms, taught by the weapons department. 3. Heavy weapons, by the Center Gunnery Department. 4. Driving and maintenance, by the Vehicle Department. 5. Map reading, sanitation, first aid, communications, and tactical training of the individual soldier including special battle courses, taught by the General Subjects Department. The only specialist school retained was the Bakers' and Cooks' school.

Battle indoctrination courses were set up using live ammunition rather than the "canned" noises formerly used. The original one-week battle training course was divided into six phases, including Combat Driving, Tank Crew Training, Tank Crew Firing, Close Combat Firing, Booby Traps, Grenades, Reconnaissance and Miscellaneous Training which included instruction in field expedients, infiltration and obstacle courses.

The trainees were moved into bivouac for this phase of their instruction, and spent the entire period living and operating under field conditions. A "Nazi" platoon gave realism in all problems, and raided the bivouac areas in "attacks." Operations also included construction of booby traps and surprise gas attacks to promote the alertness of the trainees under all phases of combat training.

Opening phases of the battle for Europe during the last half of 1943 brought no major changes in the tactics and uses of armor. Limited use of the armored vehicle in the Sicilian and early Italian campaigns showed only one weakness in the ARTC's program—a deficiency in night operations, which was promptly corrected with an increase in night work. The Center's program was found to be well balanced and practical.

By the closing months of 1943, more than 98,000 trained replacements had been turned out.

The fighting in Normandy brought, for the first time, large combination tank-infantry operations. This matter had been a source of continual study from the beginning, and its practical application in combat was instantly recognized. A further change in the Center's training program was instituted to cover this phase in August, 1944, in a course designed to give each trainee the fundamentals of all branches of the service.

Because of the heavy demand for replacements, an expansion program for the ARTC was set into motion at the close of 1944. The new program was designed to add two full regiments to the capacity of the Center.

Losses in the heavy fighting along the German frontiers brought demands for replacements to a peak, and in a move to offset the shortage of trained armored personnel it was decided to convert personnel from other branches into tankers. Originally it was planned to convert six battalions of infantry trainees who had completed their six weeks of basic at an IRTC. This plan was changed when the inactivation of several tank destroyers, airborne and cavalry reconnaissance units was ordered, and their personnel shipped to Fort Knox for conversion into tank crewmen. Some 5,000 men were converted from other branches in this phase of the program.

Trainee number 150,000 was graduated from the ARTC during the week of February 19, 1945. The major portion of these men had been shipped to the European Theater. Tank outfits in the Pacific area, however, were operating with men who had received their training at the Fort Knox center.

As the heavy fighting died down in Germany, training schedules at the ARTC were modified and by the time of the German surrender the Center's program was already well organized in the instruction of the different techniques of fighting which characterized Pacific warfare. Size of the training companies was reduced at this time to 200 men per company, with a resultant increase in efficiency.

Gunnery courses were altered to fit the reduced range requirements and methods of the Asiatic fighting, while village fighting courses were also changed to conform with the altered tactical methods of the Japanese.

With the end of hostilities in the Pacific Theater, wide modifications were made, among which were new phases of instruction to prepare the men for occupational duties, with emphasis on civil affairs and control rather than on combat training.

Major General Robert W. Grow assumed command of the Center on February 28, 1946. General Grow came to the Center from the 6th Armored Division which he commanded in the European fighting. Further changes were made in March, 1946, to accommodate additional units. These included a reversion to part of the original plan for the Center, and called for the training of mechanized cavalry, field artillery, and infantry as well as armored troops. The name of the Armored Replacement Training Center was changed on April 1, 1946, to the Replacement Training Center. The new set-up called for a Center headquarters and four regiments consisting of 28 battalions or squadrons and 75 companies, batteries or troops. Under this plan the Center is concerned with the training of mounted crews for all types of combat vehicles.

During the period of operation of the Armored Replacement Training Center, the organization at Fort Knox turned out a total of 200,261 men. These went out not only as replacements for combat units, but also aided in a large measure to fill armored divisions of the army while these were in the process of organization in the United States.

* * * *

CARDED

The Interphone System in Armored Vehicles

by 1st Lieutenant John F. Horan, Infantry[*]

EVOLUTION OF THE INTERPHONE SYSTEM

BEFORE 1938, a tank driver's back was sore and bruised after each day's operation. All signals to the driver from the tank commander, who sat behind him, were made by the commander's foot. If the commander wanted the tank to move forward, he tapped his foot against the driver's back. To move faster, the tapping was increased in tempo. To turn right or left, the foot was put either on the right or left shoulder. To back, it was pressed against the driver's neck or head. To stop or slow down, a steady pressure was used against the back of the driver.

Realizing the inefficiency of this method of communication, The Infantry Board and The Mechanized Cavalry Board, began experiments to improve it. In 1938, the first interphone communication equipment, incorporating amplification, was designed exclusively for use in tanks and other armored vehicles. The equipment was designed by the Signal Corps laboratories, and in the fall of 1938 was mounted in the M2A2 light tanks of Company E, 66th Infantry Regiment (Light) at the request of The Infantry Board. The tank crew consisted of four men: commander, turret gunner, driver, and radio-operator bow-gunner. This system allowed one-way communication from the tank commander to driver, and from commander to turret gunner; and two-way communication from the tank commander to radio operator. The interphone amplifier was a separate component, and not part of the radio set. The radio sets which were installed in the tanks for the experiment were SCR 193s and SCR 245s. No provision was made for the remote operation of the radio by the tank commander.

The interphone system later was wired to the radio through a junction box and modified to permit the tank commander to operate the radio remotely through the interphone system. At this time, microphone jacks were installed at each position in order to make possible a two-way communication with all members of the crew. Transmission over the radio by the tank commander would not disrupt the interphone system because the interphone communication between other members of the tank crew was still possible.

The basic interphone system of World War II vehicles consisted of one interphone box (BC-606) for each member of the tank crew, and some means of amplification, either as an integral part of the vehicular radio set, as in the SCR 508 and SCR 608 series, or as a separate component, as in the RC-00 or BC 605. Provisions also were made for the operation of the radio from the tank commander's position in the turret.

In the Normandy campaign, it was desirable for the tank commander to communicate with the infantry squad following the tank. Many field expedients were used, from dragging-wire with a telephone on each end, to an elaborate hookup of interphone boxes wired to the tank interphone system. In 1944, a modification work order was issued which standardized the method of external tank-to-ground interphone communication, and which has been incorporated as an integral part of the tank interphone system. At the same time, the use of the individual radio-interphone selector switches was eliminated, and the tank commander's selector switch was spring-loaded, so that when no pressure was applied to the switch it automatically returned to the interphone position. In cases of emergency, a break-in operation by a member of the tank crew is accomplished by his merely pressing the "Press-To-Talk" switch on his microphone. This automatically causes the radio to shift from radio to interphone operation, regardless of the position of the tank commander's selector switch.

The latest modification of the interphone system consists of the addition of two interphone boxes, BC-658, and the necessary cordage to install radio for infantry communication (AN/VRC-3) within the tank. The tank commander is able to operate the vehicular radio, the interphone system, or the AN/VRC-3 set by using the two selector switches on the interphone boxes. Also, the loader-radio operator is able to monitor either the vehicular radio, or the AN/VRC-3.

POSITION OF THE SELECTOR SWITCHES

	TANK COMMANDER'S		LOADER'S
	BC 606	BC 658	BC 658
Tank commander operates the interphone. Loader monitors the AN/VRC-3	Interphone	Interphone	Radio
Tank commander operates the vehicular radio, Loader monitors AN/VRC-3	Radio	Interphone	Radio
Tank commander operates the AN/VRC-3, Loader monitors vehicular radio	Interphone	Radio	Interphone

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[*]The Armored School.

The preceding chart illustrates how this is done, giving the position of each of the switches on the three interphone boxes when the tank commander operates the vehicular radio, the interphone system, and the AN/VRC-3.

INTERPHONE OPERATIONS

(The following material was compiled and revised from FM 17-67 Crew Drill, Medium Tank M-4; FM 17-68 Crew Drill, Light Tank M5; FM 17-74 Crew Drill, Heavy Tank T26; and FM 17-75 Crew Drill, Light Tank M24 by the Communication Department, The Armored School. It has been recommended that this information be incorporated in TM 21-305, Driver's Manual, to furnish a standardized system for interphone operation.)

The achievement of perfect teamwork in a tank crew requires a thorough knowledge of interphone procedure, language, and equipment, and the highest degree of discipline.

As in any other operation, the preoperative stage of maintenance or the "check" stage is used in the interphone operation.

As soon as the entire crew has mounted the vehicle, each crew member plugs in his headset and microphone in the respective jacks. The commander orders, "Check interphone." Each crew member then calls the designation of his position, followed by the word "Check." This sequence of reporting is as follows:

M26, M24, and M4:
1. Gunner.
2. Bog.
3. Driver.
4. Cannoneer.

M5:
1. Gunner.
2. Bog.
3. Driver.
4. ———.

During this procedure, each crew member adjusts to the desired level the volume-control on his interphone control box. He must check to see that the microphone switch does not remain in the locked position.

All crew members should understand that, by pressing the "Press-To-Talk" switch on the microphone, all external radio communication is interrupted. Therefore, if the tank commander is transmitting or receiving a radio message, the "Press-to-Talk" switch on the microphone should be pressed only in case of emergency.

Efficient operation demands that interphone conversation be kept to the minimum. The following terms are prescribed for interphone language:

Tank commander	"Lieutenant" or "Sergeant"
Gunner	"Gunner"
Driver	"Driver"
Cannoneer	"Loader"
Bow gunner	"Bog"
Any tank	"Tank"
Armored car	"Armored car"
Any unarmored vehicle	"Truck"
Any antitank gun	"Antitank"
Infantry	"Doughs"
Machine gun	"Machine gun"
Airplane	"Plane"

The following are commands for movement of the tank:

To move forward	"Driver, move out."
To halt	"Driver, stop."
To reverse	"Driver, reverse."
To decrease speed	"Driver, slow down."
To turn right 90°	"Driver, clock three . . . steady . . . on."
To turn left 90°	"Driver, clock nine . . . steady . . . on."
To turn left 60°	"Driver, clock ten . . . steady . . . on."
To turn the tank right (left) 180°	"Driver, clock six right (left) . . . steady . . . on."
To have driver move toward a terrain feature or reference point, the tank being headed in the proper direction.	"Driver, march on white house (hill, dead tree, etc.)."
To follow in column	"Driver, follow that tank."
To follow on road or trail	"Driver, right on road."
To start engine	"Driver, crank up."
To stop engine	"Driver, cut engine."
To proceed in a specific gear	"Driver, third gear (first gear, fourth gear)."

The following commands are for the control of the turret:

To traverse the turret	"Gunner, traverse left (right)."
To stop turret traverse	"Gunner . . . steady . . . on."

Interphone operations differ in various armored vehicles; however, all interphone systems in full-track armored vehicles are dependent on either the radio set or an interphone amplifier.

Based on the most recently authorized modifications, the following operational conditions exist:

1. In the light tank, M5, both the tank commander and the gunner are able to transmit on the radio when the "Radio-interphone" selector switch is held in the "Radio" position. All other crew members can talk and listen on "interphone" when no transmissions are being made.

2. In all other tanks, only the tank commander can transmit on the radio. All other members are able to talk and listen on "Interphone" when no transmissions are being made.

REMOTE CONTROL

by Captain William E. Felty[*]

REMOTE control equipment for radios was used extensively by soldiers in the European campaign, especially during the extremely cold and uncomfortable winter months of 1944 and 1945. The making of remote control equipment by which he operated his radio set, usually rested with the individual. The types and models designed were therefore of various sizes, shapes, and all degrees of practicability, but they all consisted of the same basic types of equipment: the necessary plugs, and long wires to the outer ends of which were connected either a control box of some sort, a microphone, headset, loudspeaker, or a leg key. Such equipment kept many men in communication work from suffering frostbite, and uncomfortable tours of duty as radio operators. In the separate tank battalion, of which I was communication officer, a workable remote control system was used which was easily installed in any CP location. It consisted of a 50-foot extension wire (Spiral Four telephone wire), on one end of which was connected a jack for the microphone plug of the transmitter, and the receiver plug. On the other end, which was to be used inside the CP, a headset and microphone was connected. This worked well until it became necessary to operate on more than one channel. Someone then had to go to the radio vehicle to select the proper push button. This was eliminated, however, by laying two sets of wires running into the CP, each connected to a radio on one of the two net frequencies. It proved a very convenient and worthwhile remote control system.

Another system, which was effectively employed by the 3d Armored Division, was to bring a complete radio set into the CP and run extension cables out to the vehicular battery. While this isn't necessarily a remote control hookup, it did reveal that communication personnel were working on means of operating radios without having to undergo withering shell fire, in addition to cold and wet weather. These ingenious devices were quickly noted by commanders and communication officers, and work immediately was started on some method to standardize remote control equipment. Through trial and error we today have a remote control unit for radio sets that will serve practically every situation.

The Remote Control Equipment RC-289 (consisting of the Remote Unit RM-39, and to be used in conjunction with a Field Telephone EE-8) will remotely operate any radio set we have. It provides for remote operation of voice, tone, or CW transmissions by radio from a field telephone connected by telephone wire to the remote unit, which in turn is connected to the radio to be used. The equipment can be used with either FM or AM sets, separately or together. This is particularly important because this one type unit can be employed in a headquarters to operate all types of radios whether they are AM, FM, voice only, or CW.

The RM-39 has a four-position selector switch covering Telephone, Radio, Through, and CW. This is used to select the type of operation to be employed between the telephone and the radio (s) being operated by remote control.

The field telephone, being connected to the RM-39, can also be tied-in to a switchboard circuit, thus making every telephone in the switchboard circuit a remote control station for the radio set.

In Figure 1 it will be noted that the arrangement is such that by talking into the telephone handset at A, the radio at D can be operated remotely to transmit a message to E. This could be a very desirable set-up for an OP utilizing equipment at A. It not only eliminates the necessity of having a bulky radio or vehicle at the OP, but provides radio communication with its headquarters or unit. (It would also have been very desirable during the month of January, 1945, in Europe, where the radio operator could have efficiently operated his radio from a cellar or from inside a building rather than having to sit in a cold half-track and nearly freeze.)

With this equipment, telephone communication can also be established from A to C by putting the selector switch on the RM-39 to "Telephone." The operator would, of course, have to be at the RM-39 unit to make the change.

Again referring to Figure 1, if the radio at D is an SCR-506, and a leg key is connected to the telephone at A, we thus provide an operator at A with a means of operating the SCR-506, even though he may be at an OP some 1,500 yards or more away. Incidentally, that would be ideal when the OP was in a tall building, because the observer could transmit information whenever he saw it. This saves time and reduces the chances of error through relaying a message to a radio operator.

In considering further possibilities of remote control equipment, it must not be overlooked that one field telephone can be used to remotely operate a number of radios on the command net frequency, one on the administrative net, and the mortar platoon net—provided a radio for each net has an RM-39 connected by wire to the telephone in the battalion commander's CP.

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[*] Communications Department, The Armored School.

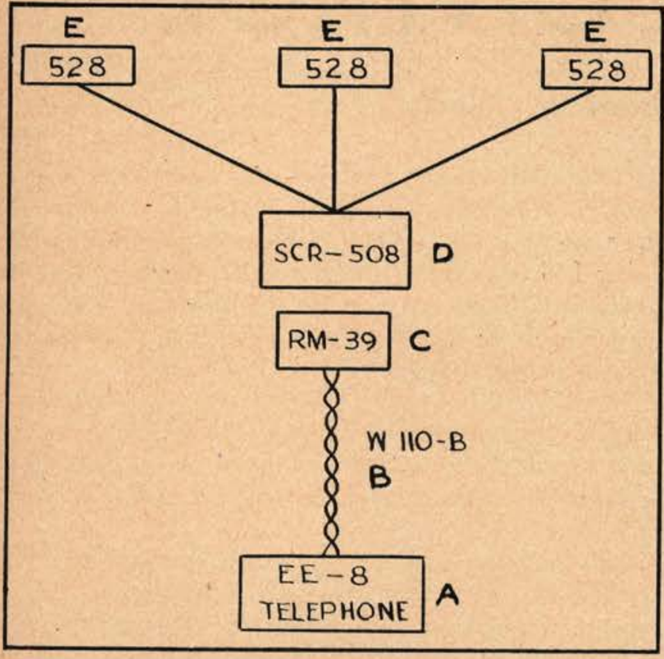


Figure 1—Showing one SCR 508 remotely operated from field telephone.

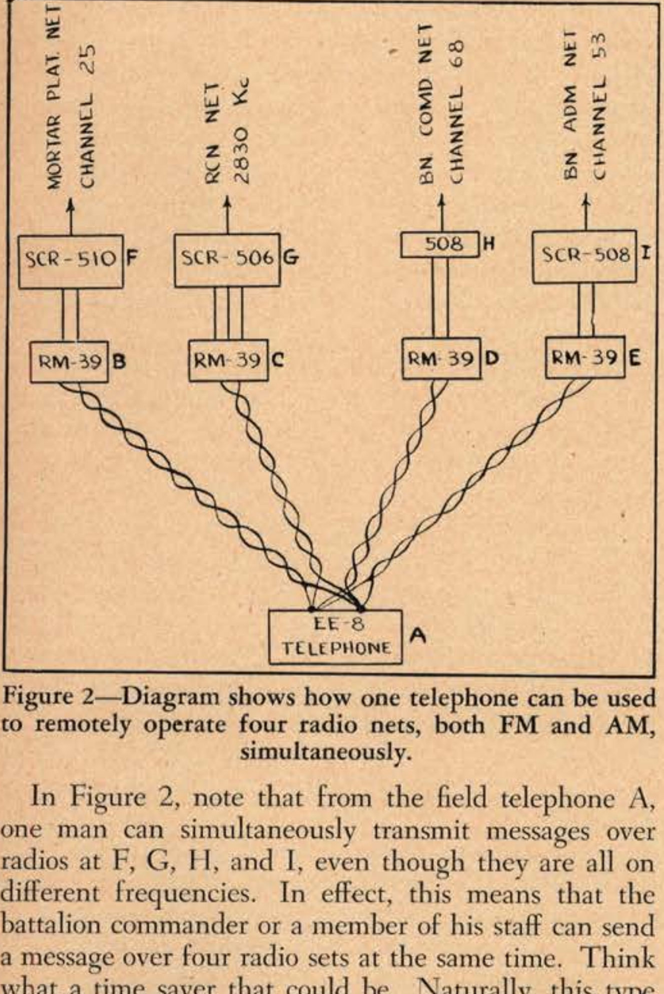


Figure 2—Diagram shows how one telephone can be used to remotely operate four radio nets, both FM and AM, simultaneously.

In Figure 2, note that from the field telephone A, one man can simultaneously transmit messages over radios at F, G, H, and I, even though they are all on different frequencies. In effect, this means that the battalion commander or a member of his staff can send a message over four radio sets at the same time. Think what a time saver that could be. Naturally, this type of arrangement would be used in either static positions or defensive operations.

It is also interesting that from the telephone in Figure 2, CW transmissions can be made over the radio at G by turning the channel selector switch of the RM-39 at C to the CW position. Also, if desired, a message can be transmitted from A over only one, or as many of the connected radio sets as desired. For example, if it is desired to transmit a message over the battalion command net and the mortar platoon net, the selector switches that were on B and D would be placed on "Through," while those on C and E would be placed on "Telephone." As a result, when the transmission is being made over the telephone at A, the operators at C and E may monitor while the message is being transmitted over radios F and H.

Note that in Figure 3, the field telephone A is connected to a telephone switchboard, "X." There are also three other telephones in this switchboard hookup. This arrangement, in effect, gives a radio-telephone switchboard to which six telephones and two radios are connected. This is true because the RM-39 units at B and C can be used as telephones. They are equipped with a ringer and bell just like the field telephone for the purpose of ringing and signaling to answer.

Figure 3 shows a very flexible arrangement whereby the operator at telephone A is in the telephone switchboard circuit. At the same time he can operate, by remote control, the radios at D and E, either singly or simultaneously, depending upon the position of the selector switch on the remote units at B and C.

Now, a matter which might be of great importance, and is particularly interesting, is that the telephone operator at Z can also operate by remote control the radios at D and E. In doing this he must be connected through the switchboard to the telephone at A. By using the same connection, he can also receive a radio message over both or either of the two radio nets. This might be of particular importance in many instances of defensive operations. It would certainly provide a means of close coördination between units. For example, if a tank battalion commander is at the infantry CP, "X," and has an urgent message for his company commanders, he can call by telephone and personally make the radio transmission to his company commanders by going through "X," A, B, and D. Many commanders can no doubt recall at least one instance during combat when they could well have used a communication link such as this.

(*For technical operation instruction, attention is invited to TM 11-2667, as amended.*)

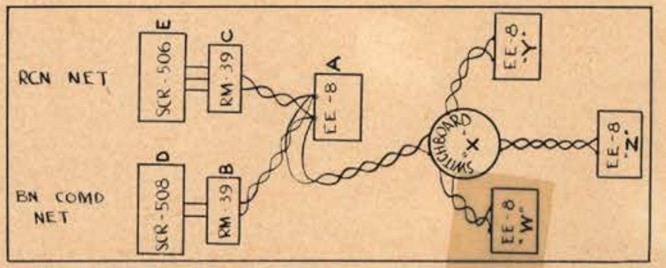
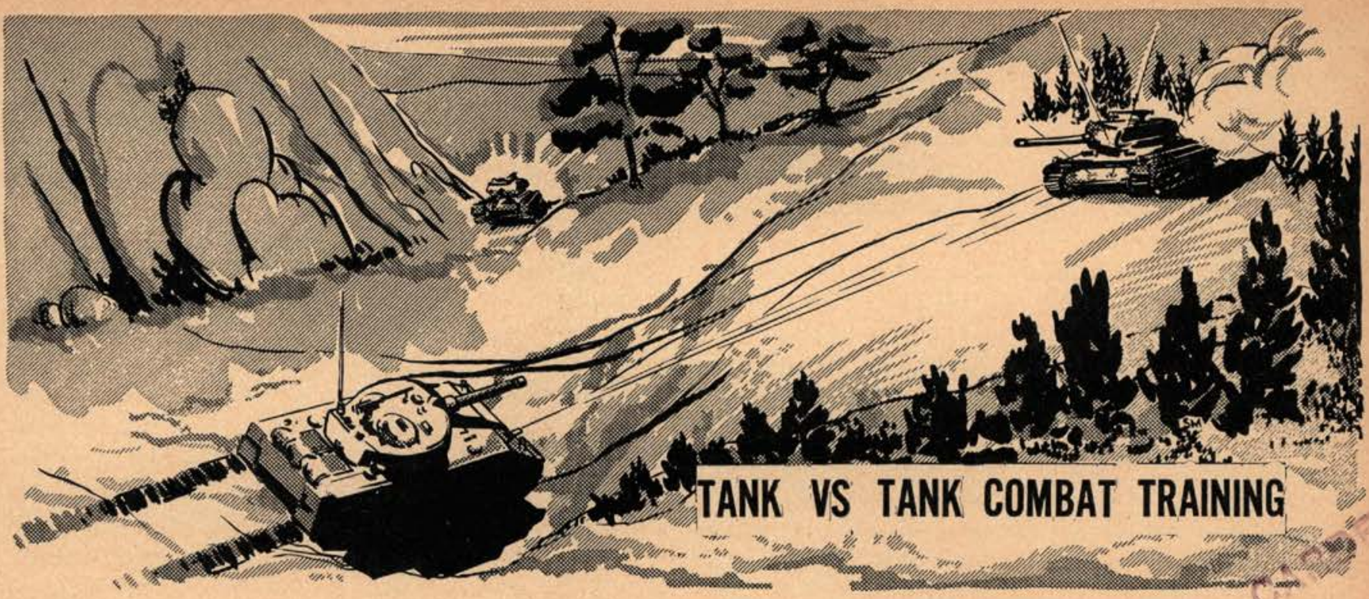


Figure 3—One telephone of a switchboard as connected to remote control units.



TANK VS TANK COMBAT TRAINING

by Major C. P. Miller, Infantry*

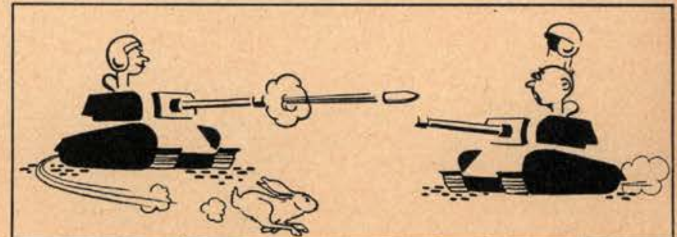
The words "Tank-vs-Tank" in the title are somewhat misleading. The purpose of the training outlined in this article is not to teach men how to fight one tank against another. Although it does give a few pointers in that phase of combat, its principal advantage is in teaching men things about their tank and equipment that cannot be obtained from a book or through drill.

A MEDIUM tank crew is rolling into its first combat. Suddenly there is a terrific clattering against the turret as enemy machine-gun fire is encountered. An odor of burned paint and hot lead drifts through the tank. At the same instant the gunner's periscope is shot away, and he finds himself looking straight upward through his sight, down which bits of glass are falling. He reaches up quickly, unscrews his periscope locking screw and withdraws the shattered pieces. A few seconds later he has replaced the shattered 'scope with another, and is searching for a target. In the meantime, the tank has continued to move forward, and the commander has maneuvered it so that the bow gunner has brought his weapon to bear and knocked out the enemy machine gun.

This action was successfully and efficiently carried out in battle because exactly the same thing happened before to this tank crew when they were in training in the States. This crew knows the sound of the impact of machine-gun bullets against their armor plate, and had periscope heads shot away before they embarked for hostile shores. They went through the uncomfortable feeling of having their tank shot at and hit in combat firing problems in the California Desert early in 1943—and they knew what to expect.

Members of the 35th Armored Regiment of the 4th Armored Division, developed "tank-vs-tank combat training" when their commanding officer desired a practical way of training tank crew teams for combat.

The training that was evolved taught personnel the necessity for crew teamwork. It forcefully drove home to tank commanders the opportunity of applying the basic principles of tank tactics, and it made them realize the problems and the importance of control. It afforded a faint taste of combat which, at the time, loomed large in the men's minds, and which cannot be described by words or pictures. It was a type of training that aroused the interest of the men, impressed them with the need for every member of the team doing his part, and in-



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*Instructor, The Armored School.

stilled in them a definite confidence in their tank. The training developed platoon leader and company commander control; and improved communications at a level where their use is vital to success, and their misuse spells disaster. The success of this kind of training was well shown in combat.

The first steps taken to set it up were comprised of making test runs during which .30 caliber ball ammunition was fired from all angles at the M5 Light Tank and the M4 Medium Tank, as issued. Cardboard dummies were utilized to detect points of entry of bullet splash, and to estimate possible damage to the tank itself. Other than negligible scarring of the tank hull, the only damage was to antennae bases and aerials, and in shattered periscope heads and punctured air cleaners. Only the coaxial machine gun was used, making it necessary to plug the muzzle of the 75mm gun and the bow gunner's ball mount opening. All outside accessories were removed. Turrent crew members of the light M5s wore shatterproof goggles to protect their eyes from occasional bullet splash.

Problems confronting the officer who is setting up a tank-vs-tank combat training exercise are many. The biggest is suitable terrain. An extensive area is needed because bullets fly in all directions. The California Desert was perfect in this respect because of its many, and often dry, stream beds, which are surrounded by high ground.

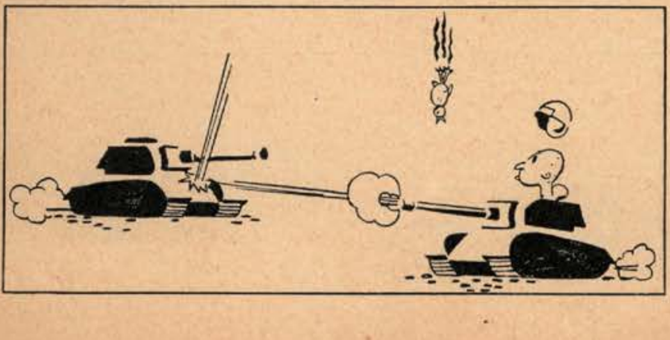
The problem of control is next in importance. One turn of a buttoned-up turret can easily confuse a tank commander's sense of direction. Accordingly, close radio control is desirable. In the training course, control was obtained through three Control Officers—Master Control, Control One and Control Two. Master Control remained stationary in a location overlooking the entire problem area, while each of the other two controls was attached to one of the elements participating in the exercise and followed it through the problem.

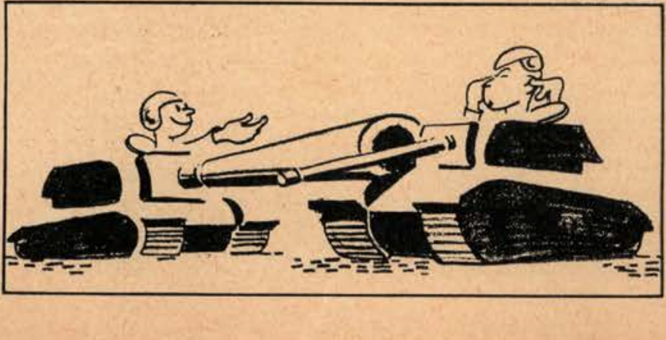
Master Control rode in an M4 Medium equipped with an SCR 508, and was in contact with the two controls as well as with each element engaged in the problem. Controls One and Two rode in M5 Light Tanks equipped with an SCR 528 (preferably a 508), and were each in contact with Master Control and also with their respective elements.

Master Control was responsible for the setting-up, coordination, and the execution of the problem, and the enforcement of the necessary safety precautions. Controls One and Two assembled their elements, and saw that they were ready to start the problem on time, and that the safety precautions were carried out. Controls also prevented tanks from moving outside the boundary lines, and saw that no gunner fired at the rear end of another tank so that air cleaners would not be damaged.

To show the general procedure, the following typical problem is described:

Master Control sets up an exercise for two medium tank platoons in a situation wherein each platoon is to destroy an "enemy" tank platoon advancing toward it down the valley. Control One, attached to Platoon A (so designated in order to follow the action), checks with the platoon leader to determine that all accessories have been removed, gun muzzles and bow gun ball mounts plugged, ammunition spaced in groups of four rounds to simulate the loading time of the 75mm, and that light tank turret crew members are wearing goggles. He then checks communications, and also sees that a medical aid man with equipment is riding in his own tank. Over Platoon A's radios, Control One can be heard telling Master Control that his element is ready. Prior to this the platoon leader has given Platoon A the situation and has issued his orders. Master Control orders "Button Up," and all hatches are closed. Control One checks all tanks, closes his hatch and reports his element ready. Master Control then orders "Move Out," and as the platoon moves forward, the light tank of Control One, clearly marked by a green pennant on its antennae, moves into position behind the platoon leader's tank. Platoon A moves down the valley in formation for about a quarter-mile, going slowly in order not to raise dust. Apparently the "enemy" has not considered the dust, for a cloud of it can be seen ahead. The Platoon deploys and takes cover. Soon an "enemy" tank moves out of the brush in front of the Platoon and rolls toward it with 'scope scanning from side to side. A Platoon gun hammers out its four rounds, and a tracer bounces off the "enemy" tank. It stops, and a yellow flag appears on top of the turret from the loader's periscope mount. The tank has been knocked out, and cannot be fired at again. But there is a terrific clanging against our own turret as a hit is scored by a tank coming out of the brush on the left flank. Our gun is cleared and up goes the yellow flag—"Out of Action." Control One can be heard





telling one of Platoon A's tanks to cease firing, and also "blasting" the tank commander for firing again after his tank had been hit. Master Control now orders, "Cease firing, clear guns and elevate muzzles"—and then: "Open hatches, report to OP for critique."

Two of the procedures in the training are contrary to those which would be used in combat, and the men should be warned against them. One is stopping the tank when it has been hit. Although this is necessary in order to retain control, it should be pointed out in each critique that such a practice is purely an artificial control measure imposed by training restrictions, and that in combat tanks must remain mobile when attacked, so that they may either outmaneuver their opponent, or seek the necessary cover to best fulfill their mission or to more fully contribute to the mission of their unit. The other falsity is in elevating the guns when the problem has ended. This is merely a visual sign that the guns have been unloaded. Crews have done this in action, and the tank has been drilled through the turret-face between the mantlet and the ring. Perhaps a better plan would be to use a flag in the latter phases of training, although this would leave loaded guns in a dangerous horizontal position.

As proficiency and control are gained in platoon exercises it is practicable, if the terrain permits, to enlarge them and employ two tank companies, each of which is reinforced by a reconnaissance platoon. The reconnaissance platoon should be mounted in light tanks. The two companies, preceded by reconnaissance, are started toward each other from points four or five miles apart. Their radios should be on different battalion channels. Information gained by reconnaissance is reported back to the company commander, who plans and directs the movement of his company. He controls his elements and directs their fire so as to mass it when necessary in order to establish a base of fire while a platoon is dispatched to effect the required maneuver. The same controls—one per company and one Master—are used as in the platoon exercises. It was also essential to add the additional precautionary ground rule of not shooting at dismounted men. For it was found, until forbidden, that the men did not hesitate to leave their vehicle in defilade and scout ahead on foot, signalling the information thus gained back to their crew for radio transmission to the company commander.

The critique covers the tactics employed by the element commander, and the conduct of their tanks by individual tank commanders. The entire problem is discussed and every man given the chance to comment on the exercise. Emphasis should be laid initially on encouraging the individual crews, and then the platoon, to talk about the difficulties encountered. During training, many crew obstacles were overcome by encouraging free discussion. Much interphone and platoon communication difficulty also was overcome.

* * * *

QMG Shipping 300 Blooded Horses

APPROXIMATELY 300 additional Thoroughbreds, half-breds and Arabs will reach the Quartermaster Remount Depots in the United States by September 10 as a result of a second trip to Germany, Austria, and Italy now being made by Colonel Fred L. Hamilton, Chief of the Remount Branch, Office of The Quartermaster General.

These horses are in addition to the 152 shipped to the Aleshire Quartermaster Depot (Remount) at Front Royal, Virginia, last fall. The latter shipment included 64 Thoroughbreds, 40 half-breds, 22 Arabs, 16 Arab-Kinds, nine Lippizanners and one Russian horse.

Most of these animals were captured from the German Wehrmacht by the American Army of Invasion. A few were requisitioned from German citizens by our Army of Occupation. Still others were requisitioned from the ex-German government (other than the Wehrmacht).

"It is the intention of the Remount Service to assign the stallions and colts, as they mature, to civilian agents throughout the country in accordance with the Remount Breeding Plan," said Colonel Hamilton. "The Arabs, Grade Arabs and Lippizanners have been shipped to the Remount Depot at Pomona, California, for use or distribution. The Thoroughbreds have been held at Front Royal. Half-breds have been shipped to the Remount Depot at Fort Reno, Oklahoma. The mares and fillies will be held at the Army Remount Depots as prospective brood mares for the production of additional stallions. All of these horses represent some of the finest blood lines in the world.

"With characteristic German thoroughness, these horses have been bred for temperament, durability and thriftiness for generations," Colonel Hamilton said. "Thoroughbreds and grades alike have been thoroughly tried in many ways, and only those with exceptional records were sent to the government nurseries for breedings. This system of selective breeding is exactly in accordance with the objectives of the American Remount Service. We feel that we can advance our Army Breeding Plan many years through adapting to our own Remount program the experience of Europeans and the results obtained by them."

Editorial Comment

Mobilitate Vigemus

WITH this issue of the Armored Cavalry Journal we set forth on what we believe to be another step in the right direction—a step which embodies the spirit of the old traditions, in the trend of modern warfare.

Although many of us who have been readers of The Cavalry Journal for many years have a feeling of nostalgia, we can be assured that under the present editorial policy (and we hope for many more years to come) the horse and all interests pertaining thereto either from a military standpoint or otherwise, will receive space in our Journal—and "OLD BILL" will occupy his usual place on the cover. A good Cavalryman could never stand still—he always tried to go forward and we believe we, too, are marching forward.

The Executive Council of your Association discussed the proposed changes over a long period of time before submitting them to the members for action. A very comprehensive statement of the Executive Council which was presented at the meeting by Major General Verne D. Mudge, Vice-President of the Association (who formerly commanded the 1st Cavalry Division during its fighting in the Pacific) covers the situation so thoroughly that it is reprinted here as an editorial.

* * *

Minutes of the Special Meeting of the United States Cavalry Association, in Washington, D. C., Monday, July 8, 1946

THE special meeting of the United States Cavalry Association was held in the office at 1719 K St., Northwest, Washington, D. C. at 8:15 P.M., Monday, July 8, 1946 for the purpose of voting on the proposed amendments to the constitution of the Association. The meeting was called to order by the President, Major General I. D. White, U.S.A.

Six hundred and thirteen members were represented in person or by proxy. This number represented a quorum.

A reading of the minutes of the previous meeting was dispensed with.

Opening statement by General I. D. White:

"Gentlemen:

As you know, this meeting is called for the sole purpose of voting on proposed amendments to the Constitution, these amendments are as follows:

Article I. Title.

The name of this association shall be The United States Armored Cavalry Association.

Article III. Objects.

1. The aim and purpose of the Association shall be to disseminate knowledge of the military art and science, to promote the professional improvement of its members, and to preserve and foster the spirit, the tradition and the solidarity of the Armored Cavalry of the Army of the United States.

2. In furtherance of its aim and purpose, the Association shall publish with such frequency as may be determined from time to time by the Executive Council, a professional and scientific journal to be known as The Armored Cavalry Journal, and conduct a book department for the sale to its members and the public, of books, maps, and periodicals.

Article IV. Membership.

1. No change.

(1) Active, for which all general officers of the Army of the United States and all officers, and warrant officers, commissioned in, and serving with, the Cavalry or Armored Cavalry of the United States shall be eligible. Active membership shall cease on the last day of the calendar year after the individual's relief from the Armored Cavalry.

(2) Associate, for which all present and former commissioned officers, warrant officers, and noncommissioned officers of honorable record of the military or naval service shall be eligible.

Before putting the articles to vote, the meeting is now open to discussion."

Major General Verne D. Mudge—"As General White has said, the purpose of this meeting is to vote on a proposal to amend the Constitution so as to change the name of the association from 'THE CAVALRY ASSOCIATION' to 'THE ARMORED CAVALRY ASSOCIATION,' as well as changes in regard to membership. As a member of the Executive Council I have been designated to give a brief résumé of the events which have led up to this meeting. My remarks will be confined solely to the change of name of the association and of the Journal.

The composition and structure of the Army have always been quite fluid. During the war they were subject to continuous examination, resulting in many changes. This analysis is continuing, with the object of determining the best in the way of a postwar Army. Many important changes have already been conceived, evaluated and acted upon.

With the importance of our Cavalry influence in mind, the General Staff therefore approved the creation of a new Arm which would preserve this influence, and decided that such a recommendation should be made at the proper time. This new Arm would be so constituted as to embrace the functions of large armored units, while at the same time maintaining the Cavalry doctrine which has been so important in our military thinking. On that basis the name 'ARMORED CAVALRY' was selected, and represents the present position of the War Department in this matter.

It might be well, at this point, to enlarge upon the proposed scope of this new Arm. It comprises all mechanized units, such as the Cavalry groups, all tank units, and all horse units of the postwar Army. It is felt that all these categories are implements of a common doctrine—the doctrine of aggressive mobility combined with great fire power. The War Department believes it unwise to attempt to maintain these three categories as separate Arms. Such a procedure would be extremely wasteful when measured against the actual troop requirements for each category in any particular theater. By combining these categories on the basis of a common doctrine a reasonable degree of flexibility is attained, permitting the organizing and employment of whatever balanced mobile force is necessary to meet requirements. It is well to realize at this point that it is not contemplated that the technique of horse units shall be abandoned. It is the intent of the War Department that horsemanship and horsemastership be retained in the Army to the extent necessary for implementation of the mobilization plan, or to meet future requirements. *We may thus regard animal elements, mechanized cavalry and armored units as the three components of the Armored Cavalry.*

What should we members of the Cavalry Association do about it? After no small amount of thought and investigation your Executive Council has concluded that three courses of action are open.

First, we can do nothing. We can await final Congressional action, following which we could survey the situation in a deliberate and orderly manner, and recommend a procedure. As a matter of fact, not to do this, is to throw ourselves open to criticism that we are acting prematurely, or unwisely, or at the least, hastily. Your Council considered that plan, and the obvious objection to it, seriously and at length. We discarded it with full knowledge of the risk entailed. But we feel that it is a calculated risk, and certainly not so great as to be avoided by a Cavalryman. The alternative—doing nothing—is distasteful, and also is fraught with the possibility that delay might prove most costly. The armored and mechanized elements are seeking today a basis for organizing, and cannot be expected to delay indefinitely. Also, many of our finest members belong to these other components. Unless we can provide some common basis we shall lose much of our strength, and be relegated to a very minor rôle. The result would probably be two or three relatively small associations, instead of one large one capable of meeting the needs of armor, mechanization and horse. Accordingly, we were not content to do nothing, notwithstanding the risks always inherent in aggressive action.

Secondly, we can circularize our own membership, as well as the officers *assigned* to Cavalry groups and tank units, in an effort to gain some sort of guidance from them. This would encourage a full discussion of the matter. It would provide many bases for future action. It might possibly even give a better solution. We don't think so. In the first place, this problem is not a new one—it has been argued and discussed within our membership for years. Secondly, it tends to cater to those who want two or more completely separate associations, to the disadvantage of our own.

Third, we can take vigorous and prompt action which should strengthen our Association at the same time recognizing the trend of coming events. After discussions with General Devers and some members of his staff, and with General White and the then commanding General at Ft. Knox, we decided to recommend bringing the matter to a vote without delay. We felt that, with the War Department committed to a course of action, the risk of a Congressional reversal on so strictly a military issue is small enough to offset its deterring influence. We feel that it is unwise to risk any fumbling, and that good judgment dictates a prompt recognition of this newly conceived Arm, and the taking of prompt and aggressive leadership therein.

Additionally, I might at this point again invite your consideration of the adverse effect which further delay may have upon the strength and prestige of our own Association. Also to the fact that many of our members are now serving with armored units, and look to our Association for leadership. And finally to the fact that the future of the horse cavalry is definitely not the issue; the issue is whether to expand the Cavalry Association to include the armored and mechanized elements, whose concepts are identical with our own, and thereby retain the leadership which our Association has always held in the field of Cavalry thinking.

Accordingly, we are recommending the changes which are on the agenda of tonight's meeting. And I wish to say that the Council makes these recommendations only after a careful study and evaluation of the situation, and certainly with a full measure of the respect for the opinions of all our membership to which their long and zealous service in the Association so justifiably entitles them."

General White—"Thank you, General Mudge. I think that clarifies the situation and I believe this statement should be published in the next issue of the JOURNAL. It will also clarify the situation in the minds of a great many of our members who were not able to be present."

After a short discussion and questioning, the Amendment to Article I was read and put to a vote. All members present voted unanimously "in favor" of the amendment. Proxy votes were counted and cast by the Secretary—440 in favor, 160 against. The Amendment to Article III was read and unanimously voted for in the affirmative by all members present—proxy vote counted as 463 in favor—155 against. Amendment to Article IV was read and a discussion followed in which some of the members wanted clarification of the interpretation of the amendment. The following explanation was made by Colonel E. M. Sumner—"Inasmuch as active membership included all officers, or warrant officers, commissioned in, and serving with, the Cavalry and Armored Cavalry, this would include those of other branches. Therefore, a Field Artilleryman, Infantryman or those of any other branch, would be eligible for active membership during the period that he was serving with an armored unit. Active membership would cease on the last day of the calendar year after the individual was relieved from duty with an armored unit. We feel that even though the individual is commissioned in another branch, that he should be allowed active membership in our association because he would obviously be interested in the welfare of the branch in which he was then serving. The active membership would also include officers and warrant officers who are members of the Reserve Corps and National Guard. Inasmuch as this report will be published in the next issue of the JOURNAL, it is recommended that any of the subscribers who are in doubt of their status as active or associate members, should write to the Secretary of the Association, who will be very glad to advise them of their membership status."

There being no further discussion, Amendment to Article IV was put to a vote. All members present were unanimously in favor—the proxy vote counted and cast as 603 in favor and 15 against.

The Amendments to the three Articles were passed by the necessary vote of two-thirds of the active membership of the Association and therefore adopted and made a matter of record.

The Secretary submitted the proposed change for the cover of the JOURNAL and it was unanimously approved.

There being no further business, the meeting adjourned at 10:45 P.M.

* * *

Commendation By General Eisenhower

HEADQUARTERS 1ST CAVALRY DIVISION
APO 201

GENERAL ORDERS Camp Drake (Tokyo) Japan
NUMBER 29 13 May 1946

1. The soldierly appearance and performance of all ranks of the 1st Cavalry Division at the review and inspection tendered to General of the Army Dwight D. Eisenhower, Chief of Staff, United States Army on 12 May 1946 at Tokyo, Japan caused General Eisenhower to write the following letter, which is so gratifying that it is published in this general order for the information of all and to make the letter a permanent record.

"12 May 1946

My dear General Bradford:

The magnificent appearance of your troops this morning has made a tremendous impression upon me. In all of my visits during the past four years, I have seen no troops who have presented a more inspiring sight. I was very proud to view such a display of military perfection.

Please extend to all of the officers and men of the 1st Cavalry Division my sincere appreciation for the honor done me, and pass on to them my congratulations for a job well done.

With warm personal regards,

Sincerely,
/s/ Dwight D. Eisenhower
Chief of Staff."

2. This order will be read to all troops at retreat.

/s/ W. B. Bradford
Brigadier General U. S. Army
Commanding

* * *

1st Armored Division Association

THE 1st Armored Division Association has been organized and has approximately 100 members. Any EM or officer who served a period of 60 days at any time, or any period of time in combat is entitled to membership. Any officer or enlisted man who served as an observer for 30 days or more, or was on detached service with the division 30 days or more while in combat is also entitled to membership.

A handsome membership certificate is available for 50 cents.

No membership dues are contemplated at this time because the purpose of the organization is to maintain a roster of former division members who can be contacted from time to time with reference to veterans' affairs, and can meet as a group during national conventions of veterans' organizations.

For membership in the association both enlisted men and officers should contact Major Franklin W. Patten, ASFTC, Classification and Assignment Branch, Camp Crowder, Mo.

* * *

Back Journal Copies Wanted

ANYONE with copies of the various issues of THE CAVALRY JOURNAL listed below who no longer desires them, is requested to send them to THE JOURNAL at 1719 K Street, N.W., Washington 6, D. C. THE JOURNAL has had requests for the issues from subscribers who wish to complete their files, and will be glad to remunerate you for them. The issues are:

November-December, 1940.
January-February, 1941.
March-April, 1941.
March-April, 1942.
January-February, 1943.
May-June, 1943.
January-February, 1944.

OTHER BRANCHES

Major General John W. O'Daniel

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True battlefield coöperation is a prime factor in the reduction of battlefield losses.

Among the prime essentials to battlefield coöperation are these two:

A battlefield discipline which will permit each unit to count upon every other unit to perform its expected task.

An intelligent understanding by units of one branch of the capabilities and limitations of units of other branches.

The first of these can be obtained only through unremitting training in garrison, in maneuvers and on the battlefield. Efforts to this end can never be slackened nor suspended.

The second can be obtained by proper education and by arousing the interest of members of one branch in the problems of others.

The "Other Branches" department of the Armored Cavalry Journal promises to be a notable and intelligent contribution to mutual understanding and interest. The Journal is to be complimented upon this conception and upon the manner in which, thus far, it has been worked out.

I commend it to the careful consideration of every Doughboy.

Major General, U.S.A.
Commandant, The Infantry School

The Bronze Arrowhead[*]

TORCH. HUSKY. OVERLORD. TYPHOON. CYCLONE. ATOMIC. . . . words that have changed history and will dominate military thought for years to come. Long before the blast of the Atomic Bomb, the plodding Doughfoot emerged dripping from the sea to blast conventional military thinking sky high. He was basically the same old Doughfoot but he had landed successfully, in force and against opposition.

THE basic principles governing amphibious warfare are identical with those of land warfare, but the vital prerequisites for a successful seaborne operation are more exacting. The coördination and coöperation between arms and services must be projected to the nth degree. Both the higher commander and the landing team commander must be equally meticulous in the planning of the operation. Details such as logistics, supply, communications, and transportation must be thoroughly checked to assure that adequate plans have been made.

Ship-to-shore operations have long been considered as extremely hazardous ventures, capable of accomplishment only by highly specialized troops under the most favorable conditions. The abortive attempts made by the British to effect a seaborne landing at Gallipoli in 1915 occupy a unique place in military history, and have long been the subject of exhaustive study by military men.

At the beginning of World War II, no nation possessed a specialized amphibious force capable of forcing a landing against a determined enemy on a well-defended shore and then continuing overland to capture a strategic objective. The success of the Japanese in their landing at Lingayen Gulf in December 1941 was due to the extreme dispersion of our own forces, and to the superiority in numbers, air power, and supporting sea power of the Japanese forces. From the strategic standpoint, our forces in the Philippines were isolated far beyond our theater of operations, and their ultimate surrender came because of geographical conditions rather than revolutionary changes in the principles of warfare.

After the Japanese successes in the Philippines and elsewhere in the South Pacific, it became obvious that any successful campaign against them would have to be launched amphibiously. The concept that a seaborne landing could be made only by highly specialized personnel with a galaxy of unique material was laid aside. In its place was advanced the hypothesis that any infantryman, adequately supported by elements of other arms and services, could be quickly trained to launch his attack from the ramp of a landing craft and, once established on the ground, could locate and destroy the hostile force.

Battle experiences from the beaches at Anzio to the heart of the Nipponese-mandated Okinawa have converted this hypothesis into an axiom. But to the doughboy, with a pack on his back and a rifle on his shoulder, the problem is eternally the same—*to attack and destroy the enemy*. Whether he walks, rides a truck, drops from the air, or floats ashore on a rubber raft, his job is unchanged.

The only difference in an amphibious operation from the standpoint of an individual infantryman is that he must train twice as hard and as long, must learn twice as much about the enemy situation and about the mission of his own unit, and must be prepared to advance in the face of enemy fire for an unpredictable distance through water and sand before he can fire a shot in retaliation. To get the doughboy's personal viewpoint on the subject of amphibious warfare, however, the three logical phases of such an operation must be examined. These are: the preparations on the near shore, the preparations aboard ship, and the assault landing.

Rough coral bottom and Japanese machine-gun fire retard the progress of infantry assault waves on Butaritari, Makin Atoll.

Signal Corps Photo

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[*] From The Infantry School.

Preparation On the Near Shore

Because of the special nature of amphibious operations, training and preparation are of the utmost importance.

Individuals must be in top physical condition in order to bear up under the intense effort expended in the initial phase of a landing. It is necessary for the soldier to carry much larger loads ashore than he would normally carry in land operations because of the uncertainty of resupply in the early stages of combat following a landing.

As a part of the extended training program preparatory to making a successful amphibious operation, all infantry battalions of the 6th Infantry Division, for instance, were given one week's training on an Australian troop transport, culminating with a "dry run" landing in New Guinea on terrain similar to that which was to be encountered in the actual landing at Lingayen Gulf. During this training the individual soldier learned how to go over the side of a ship and descend a cargo net into a landing craft, how to lash and lower equipment, to take his place in the boat, and to leave the boat when it reached the beach.

Several weeks before the contemplated operation, naval gunfire officers and their parties, an air liaison officer, and field artillery forward observers and liaison officers were attached to the unit. Consequently, all members of the battalion landing team had an opportunity to work together and to take part in a full-dress rehearsal before embarking for the actual landing. In these training rehearsals, communications were vastly improved, all attached officers and enlisted men became acquainted with the battalion staff and other key personnel, and an *esprit de corps* was developed among all members of the landing team regardless of their branch of service.

Organization of boat teams is one of the most exacting tasks required of the S-3 of a landing team. An ideal boat team consists of a rifle squad which is reinforced by elements of the company weapons platoon or the heavy weapons company. Care must be taken to balance each boat team, so that if a craft is knocked out before it beaches no organic unit such as a mortar section or a machine-gun platoon is lost. The assault waves are made as strong in fire power as possible. When a small beachhead is to be secured, armored LVTs are particularly valuable if they are used to transport the first waves a short distance inland and thus are able to protect succeeding waves landing in LCVP-type craft.

The boat team organization is usually formed long before the actual operation, and it must be flexible. While the 20th Infantry Regiment was en route to the Luzon beach at Lingayen, a Japanese suicide plane crashed into one of the transports. The casualties included the naval gunfire officer, the air liaison officer, and two operators for the naval radios which were to accompany the battalion ashore. Although no replacements were available on the ship for such key personnel, officers and men with similar skills were taken by a destroyer from another ship in the convoy and placed on the troopship prior to H Hour.

The problems confronting the battalion landing team commander are many and varied. Every detail of training and planning must point toward the far shore. Because the commanding officer's control of the situation is practically nonexistent in the early stages of the landing, he must assure himself that every possible contingency is covered in his field order. The complete order for a single battalion landing team which is operating as a part of a major task force will often cover 50 pages, and each page must be read and reread until all key personnel thoroughly understand the order.

Preparation Aboard Ship

Before boarding ship, every individual from private to battalion landing team commander is assigned a definite berth. Both teams have been carefully organized on the near shore so that each team is a tactical unit, and the integrity of these teams must be maintained until the last doughboy runs off the ramp of the LCVP and reorganization takes place on the objective.

Even in the most efficiently organized landing teams, many changes must be made in boat team assignment tables during the voyage. Men get sick and go to the ship's hospital; men fall down the ship's ladders and break a limb; enemy action causes some casualties aboard ship; or even worse, some of ship's small boats are out of commission and unavailable for use on D Day. Consequently, changes must be made in the boat team assignment table almost daily to maintain it on a current basis.

While he was on shore, the individual soldier was put into the proper physical condition. Aboard ship, he must be *mentally conditioned* to carry out his part of the operation. Usually troop mess halls are made

Infantry weapons squads pause to adjust equipment after wading ashore. Boulders in the foreground give an idea of what the Doughboys walked on while in the water.

Signal Corps Photo

available to troop officers for assembling and thoroughly briefing the men on the various phases of the operation. All component parts of the landing team field order are explained in detail to noncommissioned officers.

Landing team commanders arrange for maps, charts, diagrams, or other material that will assist in showing the soldier what he has to do when he gets ashore. Diagrams show the exact area where his unit will land, including the type of beach, terrain gradient, vegetation, water barriers, and other obstacles he may expect on the enemy shore. Air photographs of the objective, furnished by reconnaissance elements of the air force, are usually available down to the boat team level.

Physical training or periodic exercise aboard ship is frequently impossible because the decks are covered with a maze of vehicles. While en route, boat team drills are conducted frequently so that the individual will learn to instantly recognize his boat number when it's called over the loud-speaker system, and will also know the exact route to his debark station.

THE ASSAULT LANDING

During the night preceding D Day, Navy personnel open the cargo holds and rig the ship for unloading; commanders make last-minute inspections of their troops and weapons; and landing craft designated for the first wave are loaded with weapons and other matériel. Troops are fed their last meal aboard ship and wait in their compartments for the signal from the loud-speaker system.

Initiation of bombardment of the enemy-held beaches is made by destroyers, cruisers, battleships, and all types of aircraft and when the call comes for the first wave to report to debark stations, the enemy shore is illuminated by exploding shells. As each succeeding wave is called to their debark station, loaded into landing craft, and lowered into the water, the tempo of the bombardment increases.

After all organized waves have been debarked from the transport, the landing craft move to an orbiting point outside the range of enemy weapons.

Casualties to the landing craft are most numerous during the last 2,000-3,000-yard run to the beach. The boats advance as far toward the shore line as possible, but on the rocky coral beaches of the Pacific, troops sometimes debarked as much as 800 yards offshore and had to wade waist-deep water in the face of heavy machine-gun fire. Normally, however, Navy landing craft debark troops in shallow water within a few yards of the shore. LVTs with armor plate and four .50-caliber machine guns mounted on the rail frequently carry troops several hundred yards inland, and thus establish a beachhead in depth.

As each boat team continues from the ramp of the landing craft toward its assigned objective, it makes an effort to contact other elements of the parent organization. During this phase, capture of the initial objective and reorganization of units must be carried on simultaneously.

Large-caliber guns from supporting ships increase their range and fire on enemy targets beyond the beachhead. Naval gunfire officers attached to each landing team maintain direct communication with the destroyer or cruiser in support of the landing team in order to adjust naval fire on any target holding up the advance. The air liaison officer maintains contact with aircraft flying overhead, and directs strafing or bombing of hostile targets. Thus, until supporting artillery is brought ashore, the Navy and Air Corps furnish artillery support for the first few hours of the operation.

Special arrangements are made for the evacuation of casualties from the beach. Not infrequently, a man goes ashore from one landing craft, is wounded, and sent back to a hospital ship on another landing craft within the space of minutes.

Although all of the weapons and resources in the combined forces have been trained and coördinated for several months prior to the operation, and unlimited thousands of men and tons of matériel are still aboard ships of the task force, it is some tired doughfoot and his team mates who finally send up the green flare which means—"Objective Taken—Beach Secure!"

ARROWHEAD—"in the assault waves of an amphibious landing on enemy-held territory—"★

★WD Circular 56, 1946.

The Chemics Hit the Jap

by Captain John F. Carroll[*]

Signal Corps Photo

Mortarmen of the 82d CWS fire volleys of 4.2 shells in support of the 129th Infantry Regiment in Manila. Crew is grouped because Jap air force was not in strength.

DURING the early days of 1942, the Japs experienced the efforts of a gallant group of Chemics who utilized their limited resources at Bataan and Corregidor to produce effective smoke munitions. During the ensuing three-year drive back by American forces, the Japs met a new Chemic, and gained a new concept of Chemical Warfare Service operations which caused more destruction to their war industries and homeland than even the Atomic bomb.

The technical devices developed by the Chemical Warfare Service, and operated by their own troops as well as other branches, found the soft spots in the relatively tough Jap armor. CWS incendiary bombs decimated Japan's war reserves by reducing the nation's war plants to ashes. CWS tank-mounted and portable flame throwers burned the Jap out of his foxholes and fortifications, and CWS 4.2 mortars, firing white phosphorus and HE, weakened his will to carry on.

To many people who are accustomed to look upon the wearers of the crossed retorts as "gasmen," it may be surprising to learn that from Australia to Okinawa every type of CWS unit was in action. There were mortar battalions, laboratory and smoke generator companies, decontaminating, processing, depot and air operations companies. And there were floating detachments of 4.2 mortarmen—something new—who in support of landing operations fired their "Goon Guns" from the decks of LCIs, and from speedy motor craft. Their mortars put smoke and HE shells in areas the big naval guns, because of their flat trajectory, could not reach with fire.

Hidden behind wartime security and hampered by the vast distance involved before a story reached the States, is the combat record established by such CWS mortar battalions of the 82d, 85th, 88th and 98th.

The 82d first fired their mortars on New Georgia, slogged through the steaming jungles of Bougainville, dragged their carts across the rice paddies of Luzon, and practically burned out their guns during the Battle of Manila. Biak, Hollandia, Tanamerah Bay, Leyte, Okinawa and Breakneck Ridge felt the impact of 4.2 shells from the other battalions. During the 141 days of continuous combat on Luzon, the 98th Chemical Mortar Battalion established a record of firing 106,000 25-pound rounds of high explosive and phosphorus. They frequently had to inch their mortars and ammo over knifelike ridges, and fought in rags for two months without rest as they fired, what often was, the only artillery support for the armored units.

During the operations along Skyline Ridge, the mortar positions could be reached only by a sheer, narrow trail that was difficult to negotiate ordinarily, and when wet was hazardous. Traffic was entirely one-way, and the passing of pack trains was accomplished only at widened switchbacks, or embankment recesses. Although the gun positions were only 800 yards northeast from the trail, there was a difference in elevation of 1,000 feet between the two points. An hour was required to make the trip from one point to the other. Artillery and mechanized equipment were out. Because of the mobility of the mortar it could be placed in position, and it was the most important single ground weapon available. . . .

Men of the 82d Chem battalion on the north bank of the Pasig River in Manila were awaiting orders for a fire mission to clear the Japs from buildings on its south bank. A withering stream of small-arms fire came from the Jap-held Post Office Building.

After a four-hour wait, the order: "Chase out the Japs," arrived, and the first WP shells got under way. A direct hit on the roof caused several small fires. Japs came into full view, racing over the roof and attempting to beat out the flames with their rice sleeping mats. The fire-command then was for HE.

Alternating rounds of WP and HE on the building and into the surrounding area scattered the fires, and prevented the escape of building occupants. Within a short time, Manila's beautiful post office was an inferno, and a series of explosions rocked it as probing 4.2 shells found additional ammo dumps within.

Before the Japs were completely cleared from Manila, CW mortarmen lobbed more than 20,000 shells into their office building hideouts.

When the Japs were driven from the city, they fell back and dug in on their Shimbu Line in the Sierra Madre mountains and awaited, but not for long, the advance of the Sixth Army.

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[*] Chemical Warfare Service.

High up on the side of Mount Mataba, the Japs had carved out mazes of underground fortifications. On the mountainside were caves for big guns, and cliffside emplacements for machine guns and mortars.

Our planes and heavy artillery had blasted the entire area, and yet the Japs' big guns were still firing at our armor and infantry. With his infantry stopped for four days, the infantry commander gave the Chemics a free rein. Company B of the 82d Chemical Mortar Battalion, shooting from rugged mountain positions, began firing rock-crushing 4.2 shells, and WP shells whose flames and smoke drove the Japs into the open, where they were finished off, by either 4.2 HEs or infantry machine-gun fire.

Here is the way Captain Joseph Van Yush, of Lansford, Pa., told the story: "It was an eight-gun shoot when we supported the 63d Infantry in the attack on hills A, B and X of the Shimba. The Japs had heavy counterbattery on us—some of my men were wounded. Despite the fact that the Jap 150mm mortar was more than 700 pounds heavier than ours and threw a 50-pound shell, they didn't deter us very much. Besides, my men were experts. They performed the herculean task of firing 6,000 25-pound rounds from eight guns in one day. This was an average of 600 rounds per hour. As the battle raged, one gun fired 31 rounds a minute, which meant a 25-pound shell was in and out of the barrel each two seconds."

Sergeant John Wagener, of Indiana, Pa., whose gun fired 812 rounds that day, said, "If you have never been present when mass mortars are firing, you have no idea of the punishing effect they have on the crews. To make matters worse, we were in a ravine and thus caught every reverberation. That night all the men were pretty shaky and practically had to converse in the sign language, but that solid wall of smoke and fire we maintained was about the most permanent ever seen in the Pacific, to say nothing of how permanent the Japs on the other side of it were. . . . Work?" asked the sergeant. "George Pettit, my 125-pound gunner from Fort Laun, S. C., picked up, single-handed, and dropped down the muzzle of our mortar more than 10 tons of ammo that day. From dawn to dusk, we expended more than 300 2½-ton truckloads of 4.2 shells."

Frequently, the fighting in the Philippines was confined in such small areas that the evacuation of the wounded was extremely difficult. Furthermore, the Japs considered litter bearers and the medics to be targets of opportunity, and fired at them on every occasion. With most infantry outfits, when it was necessary to remove the wounded from the front lines, it became SOP to have the Chemics lay down a protective wall of smoke behind the medics.

Prior to the invasion of Palaus, it had been the policy to suspend naval and plane attacks for fear of hitting the assault troops. This deprived them of desperately needed water-level supporting fire. (This statement is amply borne out by a study of the newsreel shots of the early landings.) After some experiments, it was proved at Palaus that the amphibious 4.2 mortar was one answer to the prayer of the landing-barge passengers. The first results were so successful that the "Floating Mortarmen" had broader rôles in later invasions.

At first, it was planned to equip LCVPs and LCTs with 4.2 mortars. It was soon realized, however, that each landing craft of this type could mount but one mortar. Consequently, larger craft were used, which gave added stability and more accurate fire power.

It was also quickly learned that these trailer-mounted or soil-emplaced mortars would need baseplate modifications. The new deck-mount which was developed for the purpose consisted of a large wooden box that was reinforced with steel. The box was filled with a mixture of sawdust and sand on which rode a wooden subbase assembly, which in turn supported the mortar baseplate. The entire unit was lashed to the deck.

During the Peleliu operations, the seagoing Chemics mounted their guns on LCIs. The guns were emplaced on the main deck—one forward in the center of the craft, and the other two amidship on the port and starboard. The deck under each mortar was reinforced with steel plates. The two forward troop compartments served as the ammo dumps.

At Angaur, on September 17, 1944, the "topside" Chemics fired more than 2,500 HE rounds in support of the initial landing. The next day when the Japs infiltrated back into their previous sniper positions, they were quickly liquidated by 200 rounds which were fired as tree-bursts.

At Leyte, one group of LCI (M)s that was accompanied by rocket ships led in the first wave of assault troops, much like the blocking back in a football game punches holes for the ball carrier. These mortar boats laid down such a concentration—more than 1,200 rounds—that the landing troops failed to find a single live Jap within 500 yards of the beach edge. It was not that the Japs had withdrawn, for many were found heaped up in the trenches, the victims of concussion.

The natural versatility of these deck-mounted chemical mortars was again displayed at Lingayen and Okinawa. As the LCIs approached to within 2,000 yards, the seagoing CW men, by varying the powder rings as the ships approached to within 300 yards, were able to work over the entire area of the landing beach. They then began to cut off enemy armor and reinforcements by systematically "walking" their deck-mounted fire inland with rolling barrages which were laid at distances up to 4,000 yards. To quote one naval observer, "They are excellent artillery ships for firing into ravines and gullies which cannot be reached by other naval gunfire support ships, and their usefulness continues long after the initial assault."

It was not without cause that the Nazis referred to the 4.2 mortar as "Whispering Death," and that the Nips called it the "Automatic Cannon."

The "Sniperscope"★

THE "Snooperscope" and the "Sniperscope" have lifted the veil of darkness and made night vision possible for U. S. soldiers and marines by making it possible for them to observe and bring fire upon the enemy without visible light, and without revealing their own locations. These 'scopes operate by utilizing focused beams of infrared rays, which are electromagnetic radiations that are invisible to the eye. The two devices—which were among the most unusual instruments of World War II—were developed in 1943 by the Engineer Board, at Fort Belvoir, Virginia. As a war secret just recently released, the instruments are credited with playing an important part in jungle warfare.

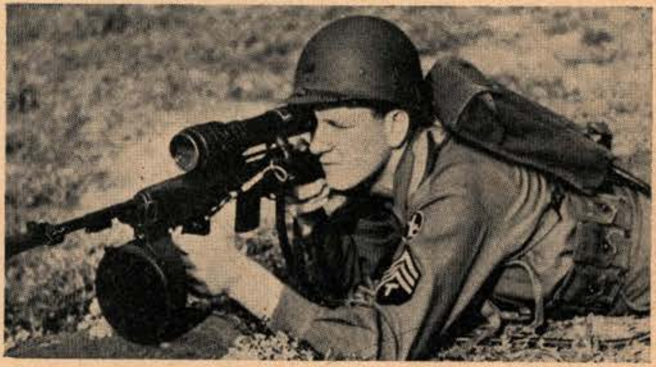
For practical purposes, infrared radiation is invisible to the human eye. However, if an infrared beam is projected upon an area, objects in this area are illuminated, and reflect part of this radiation. By means of an electronic telescope, the reflected rays are picked up and converted into a visible image which corresponds to the infrared image when they pass through the electronic lens system. The eyepiece magnifies the image according to the power of the telescope. All objects viewed through such a telescope are green.

The "Sniperscope" is light and compact, weighing approximately 28 pounds, and consists of a .30 caliber M2 carbine upon which is mounted a spotlight, which has an infrared light source, and an electronic telescope. The infrared light source and telescope are powered by a portable power-pack and battery which is carried in a knapsack on the back of the operator.

Use of the Sniperscope involves pointing the device toward some sound heard in the darkness, switching on the power supply, and scanning the forward area until the cause of the sound has been located. From the spotlight, from which all visible light has been removed, infrared rays, visible only to the operator, are projected upon the area. The reflected infrared rays are picked up by the electronic telescope and converted into a visible image. Since infrared rays are invisible to the naked eye, the enemy is unaware that he is being observed, and the operator has only to aim and fire.

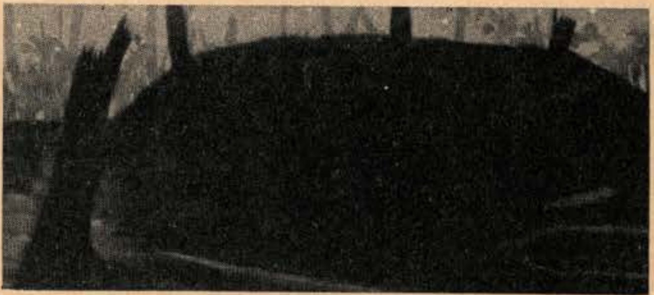
The "Snooperscope," companion and brother to the "Sniperscope," is similar in construction except that it is not mounted on a weapon. It is used for viewing objects and persons that are in complete darkness—to observe enemy activity, signal communications to friendly troops, direct fire, and to detect possible enemy use of similar equipment.

The use of the Snooperscope and Sniperscope proved particularly effective in combating Japanese night infiltration tactics, and with them on numerous occasions groups of approaching Japanese were completely wiped out. It has been reported that in the early days of the Okinawa Campaign the "Sniperscope" accounted for approximately 30 per cent of the total Japanese small-arms casualties. Employment of these weapons went far to nullify Japanese tactics, and relieve the burden of infantrymen holding down a foxhole during a black jungle night. The 'scopes greatly raised the morale of U. S. troops, who, while unobserved, could keep key areas under continual surveillance.

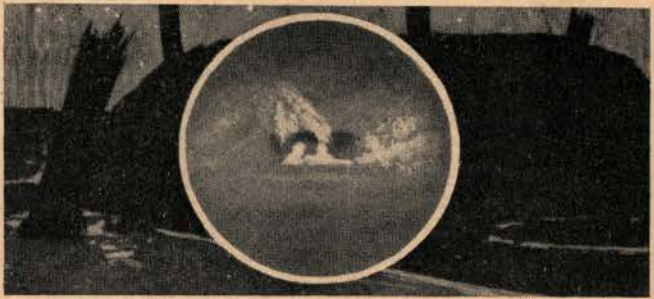


Sniperscope on carbine.

Scene in daytime.



At night, with unaided eye.



At night, with Snooperscope.

★From *Corps of Engineers.*

Signal Corps Photo

A U. S. Tank Destroyer M36 fires its 90mm gun point-blank at a Nazi pillbox emplacement to clear a path through a side street in Brest, France, in September 1944. The TD proved the master of any Nazi tank.

Signal Corps Photo

The 76mm Gun Motor Carriage M18 (Hellcat), the fastest tracked-vehicle in the world, is capable of a speed of more than 50 miles per hour, which enabled it to employ hit-and-run tactics. Its first use was in Normandy.

THE U. S. ARMORED

by Major Thomas Gentel*

Everybody is fascinated by the biggest of anything. While size alone is no criterion of quality, "the biggest" is always intriguing. Hitler was no exception, and had a mania for the largest of weapons—but the two largest self-propelled artillery weapons in the world were built by the U. S. Army Ordnance Department.

GERMANY spent astronomical sums for huge guns that were used only once. Tanks weighing from a hundred to two hundred tons were under construction. Antiaircraft "guns" that shot jets of compressed air were built but were discarded as impracticable. Other "guns" had extremely long smooth-bore tubes in which after the projectile was started, blasts of compressed air were emitted at intervals to give it a high velocity. The tubes were incredibly long—up to 500 feet. To keep them from sagging was a major problem, and the Nazis solved it by burying the tubes in deep well-like holes in the ground. Obviously, the guns could not fire on more than one target except by reducing the velocity of the projectile. There were no adjustments for azimuth or elevation. The Nazis had aimed these guns at London, but as far as we know they were never used.

U. S. HAD LARGEST SELF-PROPELLED GUNS

Thus may be seen the fallacy of trying to build the biggest of anything. The two largest self-propelled artillery weapons in the world, however, were built by

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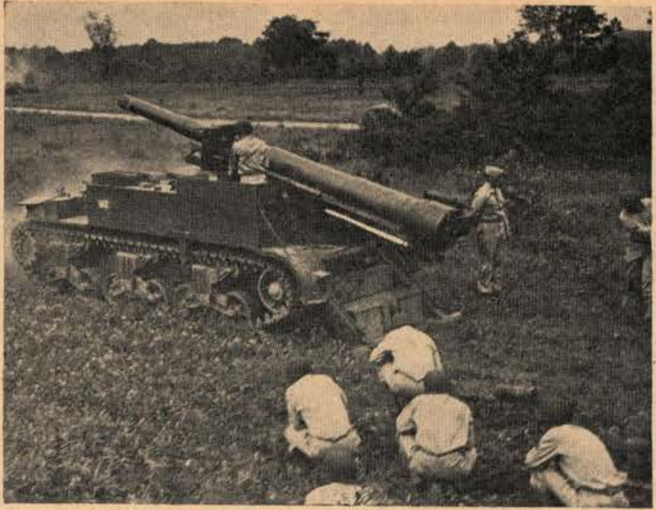
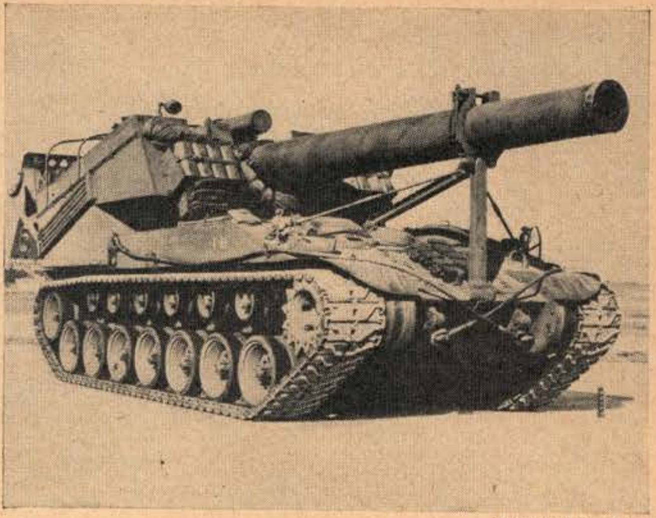
*Ordnance Department.



Signal Corps Photo
The 155mm Gun Motor Carriage M12, known as "King Kong," fired the first shot into Germany during World War II. It was the first large caliber gun motor carriage used in the war. A hydraulic spade absorbs the recoil.



Signal Corps Photo
The 240mm Howitzer Motor Carriage T92, supporting one of the most powerful weapons in the world, is a companion piece of the 8-inch gun. It can hurl a shell that weighs 360 pounds for a distance of 25,000 yards.

VEHICLES

the U. S. Army Ordnance Department. These weapons, which will be described later, were no grandiose gestures but a practical rounding out of the most complete line of self-propelled artillery in any army.

There has been much discussion on the subject of what constitutes a tank and what a gun motor carriage (self-propelled artillery). At present there is no official description of either type of vehicle. The following differentiation is offered:

The tank is a combat vehicle which runs on full caterpillar tracks. It mounts armament in accordance with its mission, and its armor is designed to give over-all crew protection against enemy fire.

An armored car, which, while giving full crew protection and carrying turret-mounted armament, is not a tank. The gun motor carriage, until late in the war, mounted its main armament in an open-top turret, and thus the distinction between the tank and gun motor carriage might be made on the basis of less "over-all" protection. The use of radio proximity fuzes and the fact that some gun motor carriages were employed in areas of friendly fire, however, made it advisable to close turret tops for crew protection, and so this distinction vanished. A further distinction might be made between the "assault" and "protective" purposes of these vehicles. The tank is a vehicle designed for mobile combat anywhere, while the gun motor carriage, with its main armament mounted for forward fire, is primarily a motor-transported type of artillery.

OTHER SELF-PROPELLED WEAPONS

The first self-propelled mount standardized in World War II—the 75mm Gun Motor Carriage, M3A1—provided mobility for the 1897A4 75mm gun. Standardized in November 1941 for antitank use, this half-track saw widespread action from North Africa to the southwest Pacific, and was the forerunner of our self-propelled weapons.

In size of caliber, the smallest self-propelled weapon is the Multiple Gun Motor Carriage M17, which mounts four caliber .50 machine guns in a Maxon turret. The Combination Gun Motor Carriage M15A1 mounts two caliber .50 machine guns and a 37mm antiaircraft gun. An experimental gun motor carriage mounting either four or six 20mm guns also was built. To provide an even more powerful self-propelled antiaircraft weapon to defend moving columns, twin automatic 40mm guns were mounted on a light tank, M24 chassis, and called the M19. Three tank destroyers were built for this specific mission. The first one to see action was the 3-inch Gun Motor Carriage, M10, the "Wolverine," which was basically an M4 tank chassis with an open-top turret mounting the 3-inch antitank gun.

Able to move at a speed of 50 miles per hour, the 76mm Gun Motor Carriage, M18, is the fastest full-tracked vehicle in any army. Its tremendous speed enables it to employ hit and run tactics by firing several rounds and speeding to a new position before the enemy can counterattack. Used first in Normandy, it ran up an impressive score in the destruction of German tanks, weapons and pillboxes.

ARMOR VS. SHELL

As the armor of German tanks increased in thickness, more powerful weapons were needed to defeat them. For this purpose, the 90mm Gun Motor Carriage, M36, was built. Again the M4 tank chassis, which had proved so reliable, was used, and a 90mm gun was mounted in an open-top turret. Known as the "Slugger," it saw heavy action in Europe and was credited with some remarkable "kills." Firing a 24-pound armor piercing or HVAP shell, this weapon proved the master of any German tank in the field. At 300 yards an HVAP shell could completely penetrate 14 inches of armor! At ranges from 2,000 to 3,000 yards it was still devastating to Nazi tanks.

Practically every field artillery weapon has been mounted on a full-tracked vehicle. The smallest is the General Scott, 75mm Howitzer Motor Carriage, M8, which was used extensively and saw action in every theater.

Probably the most famous weapon was the M7 "Priest," and its 105mm howitzer, which helped chase Rommel out of Africa. It received its nickname from the pulpit-like mount for the caliber .50 antiaircraft machine gun. A newer version of this weapon, mounted on a light tank M24 chassis and called the "New Priest," was in action at the end of the war. The 155mm howitzer was also mounted on a similar chassis and nicknamed the "Gorilla."

"KING KONG"

The first large caliber gun motor carriage used in World War II was the "King Kong," M12. Plans were started in 1941 to mount 100 155mm GPF guns on the medium tank M3 chassis. To help absorb the heavy recoil, a hydraulically operated spade was mounted at the rear of the chassis. This weapon, which fired the first shell into Germany, proved very successful. In two later developments, the 155mm gun, "Long Tom," was mounted on a General Sherman tank chassis, and the 8-inch howitzer was mounted on a companion vehicle, both of which were standardized in the fall of 1944 as the M40 and M43, respectively. In both, a new type track suspension system was used, which utilized horizontal volute springs instead of the vertical volute springs used in most of the M4s.

The field artillery pieces that have been developed by the Ordnance Department are made in "matched pairs"; that is, for every gun there is a howitzer as a companion piece. The howitzer, which is of larger caliber than the gun, has the same recoil mechanism and carriage. Companion vehicles are the 155mm Gun Motor Carriage, M40, and the 8-inch Howitzer Motor Carriage, M43.

THE 240MM HOWITZER

The two largest companion field artillery weapons are the 8-inch gun and the 240mm howitzer. These two weapons are carried on two transport wagons. A mobile clamshell bucket crane is used to dig the recoil pit and the holes for the spades. The bucket is then removed, and a hook substituted in its place so that the crane can lift the carriage from its wagon and emplace it. It then lifts the tube into place on its carriage. This process is time-consuming, and under favorable conditions of terrain and ground takes from two to four hours. This means that these weapons must be emplaced far to the rear of the lines where they will be out of the range of normal counterbattery fire of the enemy. Thus some of their powerful effectiveness is lost, for otherwise they could be used to demolish small highly fortified pillboxes and forts. For the first time, however, major field artillery can be used in the front lines if necessary . . . firing one or two rounds and withdrawing to a new position for a fresh attack.

Developing a chassis that could absorb the tremendous recoil forces involved when these weapons are fired was a major problem. The 240mm howitzer hurls a 360-pound shell a distance of 25,000 yards, and the 8-inch gun fires a 240-pound projectile 35,000 yards. The hydraulically operated rear spade used on the 155mm Gun Motor Carriages, M12 and M40, was adapted for use. As mounted on a chassis utilizing the suspension system of the Heavy Tank, M26, a side view of the chassis is similar to the M26, but one more bogie wheel has been added to give additional flotation.

A crew of eight men is the normal complement of each vehicle. When combat loaded, the weight of the 240mm Howitzer Motor Carriage is 127,500 pounds. The 8-inch Gun Motor Carriage weighs 5,000 pounds more.

Emplacement of these new weapons requires only a few minutes. While the tube is being released from its fastenings, the spade is being lowered. The vehicle is then backed up, which rams the spade firmly into the ground. The brakes are then locked. Meanwhile, other members of the crew are loading and aiming the piece. Ammunition is carried on a tracked ammunition carrier.

The war ended, however, before any of these new self-propelled weapons were used in action.

FUTURE TREND

If there is a trend in self-propelled weapons, it seems to be toward making them more like tanks; that is, with all-round armor protection for the crews. It is difficult at present to visualize a tank turret mounting a 240mm howitzer and having a 360-degree traverse. Visionary, yes, but not impossible. When fired at right angles to the chassis, a powerful gun of this nature would tend to tip the vehicle over. Heavy guns, however, could be mounted in rigid turrets that had a limited traverse. There are also practical difficulties to overcome in transportation, such as limitations on weight and size which would be imposed by bridges, boats, railroads, etc. But whatever the trend, the ultimate in self-propelled weapons is undoubtedly far from being achieved.

WAR, PEACE, AND THE MEDIC*

All over the world—wherever an American soldier slipped a clip into an M1—the Army Medic picked up his first-aid kit and faced the enemy. As a result, in the ETO alone more than 2,000 Medics gave their lives.

THE medics' mission was, and always will be, the conservation of manpower by furnishing the disabled with aid that will speedily restore them to health and fighting strength.

As a result of their *esprit de corps,* 96 out of every 100 men who reached an Army hospital in World War II were saved. The disease rate was less than one man per 1,000 a year. In World War I, more than 16 men out of each 1,000 died each year. During the Spanish-American War and the Civil War, deaths were 26 and 65 respectively out of every 1,000 men a year.

To accomplish that great achievement in maintaining the largest and healthiest United States Army in history, Major General Norman T. Kirk, The Surgeon General, gathered together the best medical brains in America. They donned uniforms and went out with units.

About 47,000 American Medical Corps officers joined the ranks along with 15,000 dentists, 57,000 nurses, 2,000 veterinarians, 2,000 sanitary specialists, 1,600 hospital dietitians, 1,300 physical therapists, and 535,000 enlisted personnel.

Medical Department men landed with airborne outfits on D Day, battled arctic gales and fought disease in the tropics so that men might live.

"A NOBLE BREED"

The late Ernie Pyle wrote, "I hope somebody in this war writes a book about the Medics at the front—they are a noble breed. They deserve more praise than I

Medics run in from No-Man's Land with a casualty on a stretcher as Germans fire on them. Tank in background has thrown up a smoke screen to aid in the rescue.

Signal Corps Photo

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*From *The Medical Corps.*

have words for—their work is deadly and it never ends."

Perhaps Pyle had witnessed incidents similar to that where the unit of Private Harold A. Garman, Albion, Ill., was evacuating three severely mangled men across the Seine. Enemy machine guns began firing. Garman instantly plunged into the icy water. Through heavy bursts of fire, he swam to the assault evacuation boat and towed it to safety. He received the Congressional Medal of Honor for doing his duty as a medical corpsman—saving lives.

Referring to other innumerable feats of daring and courage on the part of Medics traveling with combat troops everywhere, Colonel McFeyden, 26th Infantry Division Chief of Staff said, "Combat Medics perform several times a day acts of valor which performed one time by an infantryman result in a military award."

MAKING EVACUATION HISTORY

Right where these combat Medics were making history—another type of history brand-new in the war just finished was being made. It was evacuation history. When a man became a casualty, the Medical Department took over.

First aid was administered where he lay. Then he was carried to a battalion aid station, still within range of enemy weapons, for emergency treatment and medical care. In a matter of minutes he was on his way to collecting and clearing stations where, after his case was diagnosed, he was prepared for transportation to an evacuation hospital.

From that outer fringe of the combat zone he was taken to a general hospital, far removed from combat noises, where complete medical facilities were available. Then, if the wounded man could not be returned to duty within a reasonable length of time, he was sent to a modern, general hospital in the United States by plane or ship.

No effort was spared in making the patient as comfortable as possible. He was constantly under the care of college-trained, experienced physicians, surgeons, and neuropsychiatrists, who were assisted by nurses and aid men. His welfare was their chief and only concern.

In one of his inspection trips, General Kirk interviewed wounded men in the European Theater of Operations. In answer to his queries as to when medical aid was given, battle-hardened wounded invariably answered, "Right away."

IMMEDIATE ACTION CALLED FOR

That pleased General Kirk. A surgeon in his own right, he is keenly aware of the necessity for immediate action when men are wounded. To facilitate that, he reversed the usual procedure of having the patient brought immediately to the doctor.

Under the new plan, the doctor went to the patient. That system holds even today as wounded soldiers in Army hospitals receive the best treatment possible.

When hospitals were being closed because of decreasing patient load and the discharge of medical personnel, an alarming situation developed. Specialists were becoming fewer. To meet the situation a page was taken from wartime experience, and the paraplegic, amputee, blind and neuropsychiatric patients were even more centralized then they had been within a geographic location in order that the country's great medical centers be more accessible. The specialists went with them. They were not transported needless miles nor were they without expert care for an instant. As their condition warranted, patients were transported to large Army medical centers in railroad hospital trains, especially constructed, litter-lined aircraft and ambulances. No interruption in their schedules was permitted. Feeding, medicinal application and surgical examination continued.

Skilled neuropsychiatrists, who returned to combat about 60 per cent of battlefield mental casualties, nurse the mentally ill back to normal in this country today. The office of The Surgeon General was instrumental in abolishing a previous practice of noting on a man's discharge record that he had been a neuropsychiatric patient, for a patient's civil welfare is also important to the Army.

The peacetime Medic is still actively practicing his profession as "family doctor" to Army men in the ZI, and in outposts in far parts of the world. Battlefield casualties are now a thing of the past, and in their place have come routine physical inspections, X-rays, shots for overseas assignments, food wholesomeness, sanitary living quarters and dental work. This is still a job for the Medical Department, and a big one. Research into cause and prevention of disease, intensive graduate training courses and improvement of prosthetic devices will always be of importance to the Medical Department.

With a postwar Army of 1,550,000 planned, the Medical Department has been hard-hit by discharge of skilled personnel. Experienced Army medical men, however, are attending advanced courses in civilian and government institutions throughout the country. In no instance will personnel be demobilized if it jeopardizes the health of soldier patients, General Kirk has said.

Already a sweeping program of employing civilian consultants in Army medicine is shaping up. Medical men, many of whom served in uniform during the war, are available to offer advice, keep the Army up with the latest in civilian advancements, and to inspect hospitals, their personnel and equipment for a firsthand, impartial report to The Surgeon General.

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The QM's Job Today

by Henry Utley Milne

THE Quartermaster Corps' task of providing food, shelter, and clothing for the soldier of today is quite different from what it has been in the past. In World War II there were no restrictions on the conditions under which troops fought. The war theaters extended from the tropics to the arctic. We do not in the future wish to follow the disastrous military campaigns that resulted from operations in an unfamiliar environment —such as that of the Germans on the winter fronts in Russia.

In providing food, shelter and clothing for the soldier, the Quartermaster Corps must, therefore, first solve a larger problem. In the field of subsistence, it must anticipate and make use of the immediate and long-run effects of various foods on efficiency, comfort, and morale, besides studying the fundamental problems of types of rations for troops under varying climatic conditions, menus for troops in home posts and stations, types and manner of packaging and transportation, sizes and types of cans to be used, storage facilities, and refrigeration.

In the clothing problem there is not only quality, weight, texture, and color to be considered but also the mechanics of body heat production and the theory of clothing insulation in order to design warm but lightweight clothing which provides great freedom of action. Decisions must be made between the extra warmth of an additional pound of clothing as compared to the loss of mobility and energy expended by the wearer in carrying it around. Footgear must be designed to fit the requirements of operations in whatever theater.

Numerous changes in equipment, found essential from observation and use in the combat areas during the war, must be made. Means must be devised to protect clothing and equipment of all types against insects, mold, corrosion, and spoilage under new and different conditions with which the army has had little experience.

Major General T. B. Larkin, the first postwar Quartermaster General, recently said . . . "We are asking ourselves this question: 'What body protection do our people need against the gamma rays of the Atomic bomb?' It is logical that the Quartermaster Corps should supply the answer through its research into military clothing requirements. Other research will apply to each of the 75,000 items of Quartermaster supply.

"It is likewise considered important for our troops that research by the Quartermaster Corps disclose the relationship between food intake and energy expended and the amount of heat generated. Equally necessary is it to know the quality of clothing required for combat under widely different climatic conditions ranging from temperatures at 40 degrees below zero with a 40 mile an hour wind, to temperatures as high as 120 degrees above zero with no wind."

Now that the war is over and millions of soldiers have been demobilized, America's army is still approximately three times larger than it was before World War II. This increases the normal peacetime activities of the Quartermaster Corps although its personnel has been greatly reduced. The QM, however, is endeavoring to retain, even in face of the reduction, specialists of every kind—particularly those qualified in industrial management, research and development of all kinds, storage operations, petroleum engineering, textile engineering, and army supply and procurement.

The Quartermaster Corps will continue its training program. Plans call for enlarging the scope of training of QM Subsistence Officers in order that qualified personnel will be available for subsistence responsibilities necessary for maintaining the Regular Army.

Today the corps is taking stock of available items of issue at home and in all sections of the world, readjusting its program of procurement, and turning surplus articles back into civilian channels of consumption. It has developed a new field ration, made progress in the designing of a new uniform, and participated in a food conference conducted by the Army Ground Forces and the Army Service Forces at the Army War College. The purpose of the conference was the careful study of more than 200 recommendations pertaining to the improvement of field rations, including development, packaging and distribution, preparation and consumption, refrigeration, cooking and messing equipment, and the selection and training of food service personnel.

A great deal of emphasis has been placed on the immediate study and application of the lessons learned in the field during the war. The war was a proving ground for new foods, textiles and many kinds of materials and appliances. New materials were made available. New methods of manufacturing and handling were developed and, if properly applied, will improve the peacetime living for millions; developments in the processing and packaging of food may change the concept and scope of use of perishable goods; diet discoveries and food preparation may immeasurably improve the Nation's health; and countless other things are on the way to make living better and easier in the years to come.

The Quartermaster Corps will work in close alignment with every branch of industry. Its vast amount of wartime scientific research is now being released to the public. What has been done during the war and is being done today in Quartermaster Corps' research will be reflected in the consumer goods of tomorrow.

The AAF Works With THE JET*

THE jet engine, which creates a hot air hurricane to boost Army Air Force pursuit planes at supersonic speeds, is much simpler than conventional aircraft.

The jet plane is simple to operate and easy to maintain when compared with an 18-cylinder twin-row radial engine or with one of the liquid-cooled engines that powered World War II pursuit planes.

Air Force "hot pilots" have compared the jet engine with everything from a blowtorch to an oil burning lamp, but the swish—and that's about all that can be heard as it passes—is a bit more complicated than that. Its simplicity has not been overrated; but, jet power is, at best, a far cry from anything as fundamental as roller skating.

The jet engine was developed during World War II, but its greatest value was not clearly demonstrated until after the war. The original engine has been considerably improved and fuel consumption has been cut to extend range.

Today, after establishing sensational speed records in transcontinental flights, the P-80, "Shooting Star," a jet-propelled airplane manufactured by Lockheed, and powered by the General Electric "J-33" engine, has been adopted as the first plane for postwar pursuit outfits.

General Carl A. Spaatz, Air Forces Commanding General, has ordered P-80s for many pursuit and interceptor groups and the transition to this plane is well under way.

The pilot of a conventional aircraft experiences no particular difficulty in flying a P-80 because the flight controls are the same. He may require a few hours transition training, but this can usually be accomplished without delay. The change to a "Shooting Star" is largely a matter of learning how to "feel" controls at vastly greater speeds, and in becoming accustomed to the idea of staying ahead of the sound of his own engine.

Since the jet engine is totally different from conventional radial or in-line models, however, keeping these "hot shots" flying does pose the necessity of special training for the mechanics and the maintenance men that handle them.

Air Forces leaders have adopted the jets as standard for some pursuit groups, and the "keep 'em flying" lads of the AAF Training Command are cooperating.

The Training Command, commanded by Lieutenant General John K. Cannon with headquarters at Barksdale Field, La., is responsible for the training of all individual air crew members and technicians of the AAF. Flying crew members are trained through the subordinate Flying Training Command, with headquarters at Randolph Field, Texas.

The training of technicians is channeled through the subordinate Technical Training Command, Scott Field, Ill., which is pioneering the schooling of mechanics for jet engines.

The school, opened last October at Chanute Field, Rantoul, Ill., is busily engaged today turning out 40 graduates each week. Graduates are authorized to perform first and second echelon maintenance and are fully responsible for correcting day-to-day malfunctions and performing daily and preflight checks of equipment. Third and fourth echelon maintenance and overhaul will be done by maintenance shops.

The six-week Chanute Field course is the first of its kind. Most of the students encounter their first P-80 when they enter their hangar-classrooms; morale is no problem because of their enthusiastic interest in the plane.

All students were technicians on conventional airplanes before they began jet schooling. To be eligible for this specialized jet training, the trainee must be a graduate of an AAF basic aircraft maintenance school, or its equivalent. Upon graduating from the P-80 school, students are fully capable of acting as line chiefs, crew chiefs or engineering officers, depending upon their past training and assignment.

The course is of a new and distinct type, and the demand for P-80 maintenance experts is great, but Training Command officials are determined that it will be complete and adequate. Highly rated civilian jet engine specialists instruct the men. The civilians, all recognized experts, enable the Air Forces to offer its men the finest training available in this field today. All instructors are graduates of aircraft maintenance schools and have had specialized courses in aircraft electrical, instrument, power plant and hydraulic systems.

In marked contrast to the almost exclusive "learn by doing" expedient of wartime AAF training courses, the P-80 mechanics school devotes a considerable period of time to the study of theory.

This closer attention to background material is regarded as typical of postwar AAF training. Theory

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*From *Army Air Corps*.

phases are expected to be continually enlarged during the interim training period, and to play a large part in peacetime training courses.

"The Training Command could not spare the time to devote long periods to a study of theory in wartime courses," General Cannon says. "Men were needed too desperately by the operational units. Theory was explained, but students graduated from technical courses during the war learned mostly by doing—graduating as men who knew their machines through the expedient of taking them apart and putting them together again. They learned how to locate malfunctions by working with equipment that had been deliberately put out of order by instructors. Learning by doing has proven an excellent system, and it will be augmented—not superseded—by theoretical study. More knowledge of theory will benefit the student enormously because it will enable him to assimilate new technological developments with greater ease."

Classroom study on the theory of the jet engine takes about one-fourth of the six weeks' course at Chanute. The remainder of the study period is spent in actual contact with the sleek P-80 and its engine.

This phase of training is highly complete. Engines are started in test blocks and run through the various speed ranges. Cut-away engines also are available that enable the trainee to see the interior and complete operating mechanism of the assembled unit. P-80s are used extensively in the training program in order that students may learn to remove and install complete engine units in record time.

The course is divided into four phases. Phase one is a study of airplane structure and hydraulic systems. Students learn to inspect and maintain the wings, fuselage, empennage, control surfaces and flight control mechanisms. Inspection and maintenance of landing gear, brake, fuel and oxygen systems is also a part of this phase, which lasts for two weeks.

In the second phase, which lasts one week, instrument and electrical system "trouble shooting" is studied.

Phases three and four, which students find most interesting, are taught in the final three weeks of the course. The jet engine, engine accessories, engine change and inspection, are studied thoroughly.

Students in these final phases begin to speak of "pounds of thrust" instead of horsepower, of "jet propulsion thrust" instead of propeller thrust. They learn to start the engine, run it through its speed ranges, check for any malfunction and stop it at the end of the check.

The blindingly fast, hard-hitting P-80 seems indicative of tomorrow's U. S. Army Air Forces. The Chanute Field course for jet engine mechanics is the Training Command's indication that regardless of how fast AAF planes may fly or how smoothly they may maneuver, the Training Command will be ready with the men to "keep 'em flying."

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Ordnance Men Foresee Rockets Circling the Globe*

ORDNANCE scientists are probing the possibilities of using special warheads on antiaircraft weapons which will neutralize the threat of high-altitude bomber formations, according to a statement made by Major General Everett S. Hughes, Chief of the Army Ordnance Department.

It is anticipated that some of the bombers of the future will fly at altitudes far above effective antiaircraft gun ranges. It is difficult now for our pursuit craft to attack enemy bombers flying in formation because of the protection furnished by enemy bombers to each other, Army airmen state.

In order to solve this problem, the scientists of the Ordnance Department's Ballistic Research Laboratories at Aberdeen Proving Ground plan the development of a guided missile which would carry a charge intended to be exploded in the midst of an enemy bomber formation where it would be highly destructive.

Ordnance scientific strategists think that if enemy bombers are prevented by the threat of such a weapon from flying in formation, they will become vulnerable to the attack of individual fighter aircraft.

The Ordnance Department is now testing rockets with potential ranges of 200 miles at White Sands Proving Grounds, N. M., but the rockets of the future are expected to travel thousands of miles. A joint Army-Navy Commission of which the Ordnance Department is a member is searching the United States, Caribbean and Pacific areas for a range where it will be possible to test contemplated rockets over a distance of 2,000 miles.

Long-range planning by Ordnance scientists, however, forecasts the ultimate range of guided missiles to 20,000 miles—weapons capable of circling the globe.

*****_Army Times._

CARDE

ROCKETS AT WAR*

U. S. Navy Photo

The "Tiny Tim" rocket—a projectile ten feet long and weighing 1,200 pounds—unloosens a demonstration of its offensive firepower from this Navy F-4U Corsair.

IF any one weapon symbolizes the flaring crash and swift destruction of World War II it is the rocket. Every major participant used rockets. Each nation developed rocket weapons in answer to its tactical and combat needs. The Russians pioneered in the firing of antitank rockets from planes and in the use of massed banks of rockets for preassault barrages. The British used rockets for defense against attack from the air at a time when there were only 500 antiaircraft guns in the United Kingdom. With their *Luftwaffe* driven from the skies, the Germans employed the long-range V-2 weapon to attack England's cities. The Japanese futilely attempted to use rocket artillery to defend their island outposts.

The United States, too, developed and introduced a great variety of rocket weapons. By the time the war ended, American soldiers, sailors, and marines had fired millions of rockets at the enemy. For those rockets, our armed forces could thank the teamwork of American science, industry, and the military at home.

When the Japanese attack on Pearl Harbor catapulted the United States into the war, our Army and Navy had not a single rocket in service use. Plans for rockets were limited. By VJ Day, the Army was procuring rockets at the rate of $150,000,000 a year. The Navy had 1,200 war plants turning out rockets at the rate of $100,000,000 a month.

There was "Tiny Tim," a 1,200-pound aircraft rocket, a weapon which gives a fighter plane the punch of a 12-inch gun; other aircraft rockets; a "Super-Bazooka," more lethal and accurate than the original infantry weapon; the Navy's new rocket gunboats, the LSM-R's, firing 5-inch spin stabilized rockets from automatic launchers at the rate of 300 rounds per minute.

The Rocket's Advantage

A principal advantage of the rocket is its lack of recoil.

Anyone who has fired a gun knows that the burning of the powder in the combustion chamber drives the bullet out of the barrel and that the reaction to this forward push against the projectile is a backward push against the gun—and the person or the gun-mount holding it.

Compared to a rocket, the speed of combustion in a gun and the gas pressure developed are extremely high.

Because of the recoil and the high pressure, guns and gun-mounts must be strong—which means weight.

A rocket is without recoil in the sense that no metal parts are pushed backward. One might say that a rocket reverses the recoil effect. It shoots gases backward at high velocity and is itself pushed forward by the recoil.

Lacking recoil, a rocket can be fired from a simple, light tube or trough which serves merely to point the rocket in the right direction when it starts its flight. As a consequence, rockets may be fired from structures which could not hold up the weight of a gun and its recoil-damping mechanism, nor withstand a gun's recoil force.

The comparatively light weight of rocket launchers gives the rocket a mobility enabling it to go many places impossible to a gun.

Disadvantages of Rockets

Although rocket launchers are usually lighter than guns, the rockets themselves, because of their motor weights, are usually heavier than shell and bombs of equivalent size and effectiveness. For repeated firing from fixed locations, this weight differential may complicate the problem of ammunition transport.

The blast of high-temperatures, high-velocity gases from the rocket is a hazard and inconvenience. Launchers must be so mounted as to leave a clear space behind them, or blast shields must be provided. Also, the flash of rockets may reveal firing positions.

Many rockets are slower than equivalent gun projectiles and hence less effective in the penetration of hard targets.

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*U. S. Rocket Ordnance. Joint Board of Scientific Information Policy.

Although forward fired aircraft rockets have accuracy comparable to that of guns, most ground-fired rockets do not; a large number of rockets must be fired to hit a point target. This lower accuracy in ground fire, however, is of little consequence when it is desired to saturate an area target.

Rocket Characteristics

A look at an assortment of standard American rockets will show that their weights range from three to 1,300 pounds, their diameters from two to 12 inches, and their lengths from one to 10 feet. In many rockets, most of the length is in the motor. In some, the motor is of smaller diameter than the head.

The velocities of American military rockets vary from 65 to 1,500 feet per second and their maximum ranges in ground firing are from 40 yards to 10,000 yards.

ROCKET ARMAMENT FOR AIRCRAFT

When the scientists of National Defense Research Committee and their Navy colleagues produced "Tiny Tim," latest and biggest American aircraft rocket, it was as if they had put wings on a pair of 12-inch guns and lengthened the guns' range to that of a medium bomber.

This giant rocket was the culminating achievement, as the war ended, of a program of aircraft rocket development which gave the American fighter plane the ability to hurl at an enemy target more high explosive than is carried in a salvo from a light cruiser.

"Tiny Tim" was science's answer to the fighting services' demand for "a really big rocket."

Here, first told publicly, are its vital statistics:

"Tiny Tim's" over-all length is 10 feet 3 inches; its diameter is only a quarter-inch less than a foot. Its weight is 1,284 pounds.

"Tiny Tim's" usual head, one of several, is a semi-armor-piercing bomb with a total weight of 590 pounds, of which 150 pounds is an explosive charge of TNT. A charge of 146 pounds of powder drives it through the air. Though its development was not completed until shortly before the end of hostilities, "Tiny Tim" was on hand to hit the Jap on Okinawa.

Rôle of Aircraft Rockets

From early in 1944, on through the remainder of the war, forward-firing aircraft rockets played a significant and increasingly important part. First used in Burma, aircraft rockets later did their bit in the Normandy invasion and the advance across France and into Germany, in the Mediterranean theater and the invasion of southern France, they went to the Pacific where they really came into their own in the Saipan-Tinian-Guam operations and those that followed.

Aircraft rockets were a valued supplement to the bombs, machine guns, and cannon of the military airplane. Rockets are more accurate than bombs, but weight for weight do less widespread damage. Rockets are less accurate than machine guns and cannon, but pack a bigger punch.

Aircraft rockets were especially effective against warships up to destroyers in size and against smaller cargo, transport, and escort ships, or against large warships to silence their antiaircraft batteries.

In attacks on enemy airfields, rockets were particularly useful to destroy radios and radar installations and smaller buildings, parked planes, and fuel dumps.

Aircraft rockets were valuable in attacks on tanks, light guns, concrete pillboxes, and locomotives.

Other Rockets

Other rocket developments by the California Institute of Technology, and by another division, known as Section H, were as follows:

A rocket, known officially as the 5-inch HVAR (High Velocity Aircraft Rocket), was developed—and the vigor of its blast quickly won for it the respectful title of "Holy Moses." It was six feet long, weighed 140 pounds, and had a velocity of 1,375 feet per second. It went into combat use in July 1944.

Another, the 115mm aircraft rocket was developed to meet the demands of the air forces for higher velocity and better accuracy than the M8, especially against moving targets at greater ranges. Never used in combat, it could pierce five inches of homogeneous armor plate.

Finally, squadrons equipped for firing "Tiny Tim" sailed for the Pacific on the carriers *Franklin* and *Intrepid*. The *Franklin* was struck by a Japanese dive bomber before its planes could fire "Tiny Tims" in action. But the planes of the *Intrepid* did launch "Tiny Tims" against the enemy on Okinawa. Unfortunately, the results could not be accurately assessed. There were, it seems, so many things being thrown at the Japs on Okinawa that it was impossible to distinguish the wreckage caused by "Tiny Tim" from the general destruction.

D Day, Thunderbolts and HVAR's

Both American and British rocket-firing support groups, with Navy shells screeching overhead, moved up to the Normandy beaches and turned them into flaming floors of fire.

Shortly after D Day a few Thunderbolt fighter planes were equipped with eight HVAR rockets apiece. They were especially effective in supporting the break-through at St. Lou. One or two Thunderbolts hovered constantly over the smashing, advancing tanks of the Third Army and attacked German heavy tanks and 88mm antitank guns when they threatened to hold up the American advance.

Numerous attacks were made early in July on tanks, locomotives, rail yards, bridges, and airfields, and spectacular results were attained. The P-47 group scored hits on some of the heaviest German tanks, knocking them out of action, thus aiding our ground forces to move forward.

P-47s Attack

On July 17, 12 aircraft, carrying four rockets each, attacked the rail yard at Tiger-Quail. A direct hit was made on a flak tower on the first run, silencing it. In subsequent runs 25 locomotives were damaged, also three repair shops and a roundhouse. On the following day 12 aircraft attacked the airfields at Coulommiers. Thirty-seven rockets were launched at 1,000-yard range from a 30° dive. One large hangar, four small hangars were hit, an Me-110 and a fuel dump destroyed. Later a rocket was fired from 800 yards at two staff cars, passing through the first and exploding in the second. A rail bridge at Montford was claimed destroyed by seven rockets.

On July 25 and 26 a total of 64 rocket sorties were flown, destroying 12 tanks, damaging 13, scoring many near misses, and destroying three and damaging three other vehicles. From then on these rockets were continuously employed by the AAF in the European theater, with devastating results.

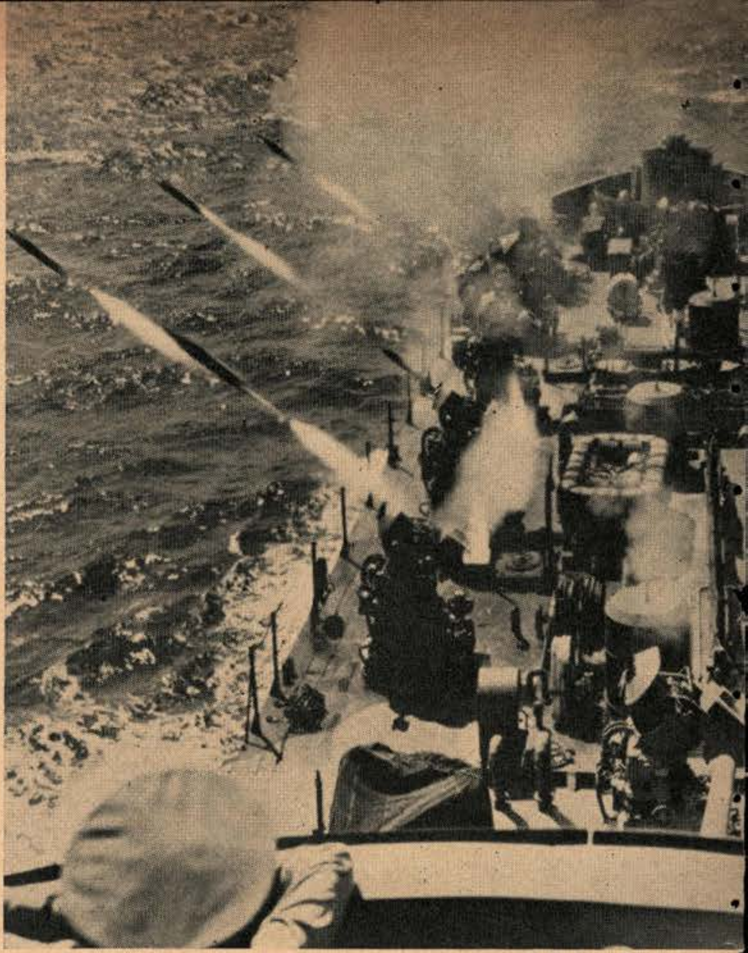
As more and more installations and rockets reached the forward lines, the effectiveness of the HVAR became more apparent. In addition to the actual damage inflicted on enemy material, the personnel of the German ground forces had such a tremendous respect for this new weapon that upon the approach of a rocket-bearing aircraft, it was reported, they would frequently leave their vehicles and guns in headlong flight for the security of foxholes and other hideouts.

P-47s firing 5-inch high velocity aircraft rockets also were used extensively in helping to turn back the German counteroffensive in August.

From February 1944 to the end of operations in the Pacific, aircraft rockets were an important weapon. Navy TBFs and TBMs fired them in the Marshalls, Palau, New Guinea, Carolines, and Marcus-Wake actions. In the Marianas operation, from June 11 to August 1, Navy planes fired a total of nearly 5,000 rockets against the enemy. By that time, rocket-firing F6Fs were in action and joined in this first large-scale demonstration of the aircraft rocket as a weapon for close-support work. Aircraft rockets, though in considerably lesser numbers, were used in actions in the western Carolines, July 25 to 28, and the Marianas and Bonins, July 29 to August 3.

Blasting Out the Enemy

As a weapon to dislodge the enemy from well-fortified positions, and to support our ground forces, the rocket was used more widely than in any other application and was ideally suited to its task. When our forces landed on Saipan, Guam, Tinian, Iwo Jima, and Okinawa, they found the Jap burrowed in caves, blockhouses, and pillboxes. These were artfully camouflaged and difficult to detect, so well protected that only direct hits were effective, and well defended by antiaircraft guns. Aircraft rockets with their accuracy and penetrating power proved superior to bombs against such targets. Effective and close liaison was set up between the ground forces and the carrier forces supporting them. Wave after wave of rocket-equipped fighters flew in at low altitude sending their rockets into the heretofore invulnerable Japanese positions that were taking such a toll of our advancing ground forces.



U. S. Navy Photo

The new LSM (R) is shown launching rockets with automatic firing and remote controlled rocket launchers. On island landings, such firing moved the Japs far back.

The ground forces soon learned the value of the aircraft rocket and the rocket planes were called upon whenever tough obstacles presented themselves. An air coördinator, armed with rockets with smoke heads, was kept over the target continuously during the duration of the strike. Radio contact with the ground forces indicated the targets which were giving them the most trouble and which they wanted wiped out. The air coordinator marshalled his rocket planes, made an approach with smoke-head rockets to indicate the exact target, and left the rest to the planes armed with rockets with high explosive heads.

ROCKETS IN AMPHIBIOUS WARFARE

The Crucial Interval

Fired from American landing and support craft in the amphibious operations of World War II, barrage rockets saved thousands of American lives. In the Pacific, they were one of the factors which caused the Japanese to change the pattern of their resistance to American landings. With barrage rockets, American commanders were able to drench landing beaches for considerable distances inland. Barrage rockets helped give assaulting soldiers and marines the fighting chance they needed to win a toe hold without that bloody slaughter in the surf and on the sands which made American leaders, after Tarawa, wonder how we could continue to pay the human cost of island conquest.

It became grimly plain, as American forces fought their way from island to island, from landing to landing, in the Pacific that the crucial phase in amphibious operations is that interval between the moment the naval and air bombardment must be moved inland and the time the first assault waves hit the beach. It is that interval which gives the beach defenders the chance—as at Tarawa—to organize and pour a murderous fire into the landing forces.

The barrage rocket answered the vital question posed by that interval. It enabled small craft, for the comparatively short period of the actual landings, to strike with the hitting power of destroyers against enemy strong points within small-arms range of the landing beaches. Before the close of the war, the enemy had paid final tribute to the effectiveness of the barrage rocket. The Japanese first line of defense—as at Okinawa—was pulled back from the beaches out of rocket range. Soldiers and marines came ashore against astonishingly light opposition—only it was not astonishing. The barrage rocket had imposed its powerful logic on enemy tactics.

Okinawa

In the last great amphibious operation in the Pacific, the conquest of Okinawa, rockets really came into their own. Here were combined to a degree never before realized the use of rockets on land, from the air, and from the sea.

A flotilla of 12 rocket ships went into action at Okinawa on March 26, 1945, and for the next 12 weeks poured ashore in support of land operations a total of more than 30,000 rockets.

In the closing days of the Okinawa campaign, four ships of the rocket fleet were assigned to the Tenth Army Artillery section. Directed by artillery aircraft observers, the rocket ships loosed day and night bombardment fire against last-stand Japanese troop concentrations.

It is noteworthy that, while eight of these rocket ships were equipped for firing improved, fin-type rockets, four of them were fitted to fire spin-stabilized rockets—representing a development in rocket design of major importance. These four ships, each with an installation of 85 automatic launchers, could get off a salvo of 1,020 5-inch rockets in approximately one minute.

Super-Rocket Ships

The part played by the rocket ships at Okinawa concluded the combat story of shipborne rockets in World War II, but it is not all of the story. For, good as the rocket ships were, they were hurriedly contrived interim vessels. On their way across the Pacific when the Japanese sued for an end to hostilities were more examples of the surprise weapons which never had a chance to hit the enemy. These were the first of 48 super-rocket ships planned by the Navy. These LSM(R)'s pack an even greater punch than the ships that fought at Okinawa. Each ship carries 40mm and four 20mm twin mounts, four 4.2-inch chemical mortars, a 5-inch dual purpose gun, and 10 rocket launchers, continuously fed and automatically fired, and aimed by remote control, each capable of firing 30 spin-stabilized rockets per minute, or 300 rockets per minute per ship.

ROCKETS FOR GROUND WARFARE

The explosive powder and the 4,000-yard range of the Army's folding-fin 4.5-inch aircraft rocket indicated that it could be used as a ground force weapon to supplement the artillery.

As compared with artillery, the rocket lacked range, velocity, and point accuracy, but the absence of recoil made possible the launching of rockets from lightweight devices which were easily moved and quickly set up in places where artillery could not go. Furthermore, by massing a number of launching tubes or rails on a single mount it was possible to fire a great many rockets from one launcher in a very short time.

When such multiple launchers were used, the inherent dispersion of the rockets became an advantage for certain types of fire; for without changing the position of the launcher the rockets were spread over a beaten zone of predeterminable size. Rockets were able in this way to lay down a drenching fire upon an area target such as a patch of woods, a town, or a supply depot so quickly that enemy personnel had no time to take cover. A similar concentration of fire, known as timed fire, could be laid down by artillery, but only after elaborate preparations. Rockets gained the same effect in less time and with only a fraction of the personnel.

The Pacific Theater

The rocket's ability to hurl heavy projectiles from light launchers provided a countermeasure to the Japanese tactic of holing up behind coconut log bunkers deep in the jungles of Pacific Islands. The folding-fin 4.5-inch rocket had the power to blast these bunkers, and the Ordnance Department developed an expendable plastic tube launcher in which the rocket was shipped and from which it was fired.

The advantages of spin-stabilized rockets over finned types for amphibious warfare—ease of handling and better accuracy from shorter launchers—were equally valuable in land warfare. In late 1943 the Army Ordnance Department initiated development of its 4.5-inch spinner. In comparison to the 4.5-inch folding-fin rocket, the spinner, though it retained about the same total weight, carried a heavier payload with better accuracy to a greater distance—5,250 yards instead of 4,000. This increased range allowed more flexibility in the choice of firing positions; it made it possible to fire from positions beyond the range of most enemy mortars.

CARDED.

Bazooka Versus Tank★

Among the now-it-can-be-told weapons of the American rocket family, is the super-bazooka, bigger and better version of the foot soldier's famed tankbuster.

BY their surrender, the Germans and Japs missed feeling the impact of a rocket which travels at almost twice the speed and carries double the explosive payload of the standard bazooka projectile; which has an effective range of as much as 700 yards, instead of the 200 to 300 yards of the regular bazooka; and which can function safely through a considerably wider temperature range, thus affording greatly increased protection against the dangers of motor explosion and blast. Though the super-bazooka retains the 2.36-inch diameter of the original bazooka, and is fired from the same launcher, it is propelled by a larger motor, and its heavier explosive charge can penetrate thicker armor plate.

Another development of the original bazooka—still secret at the war's end—is a super-powered rocket of 3.5 inches in diameter with greatly increased power to penetrate armor plate and reinforced concrete.

Using a knocked-out German tank in an action that was staged, an American trooper blows off the tank's track, seen on the left, with a hit from a Bazooka rocket.

Signal Corps Photo

The super-bazooka was the joint product of Section H, which produced the design for the motor, and Division 8 of the National Defense Research Committee, which developed the far more powerful head. The 3.5-inch rocket was designed by the Army Ordnance Department.

BAZOOKA DEVELOPMENT

To arm United States infantry to fight tanks on more nearly equal terms, the Army Ordnance Department, in early 1941, had under development a rifle grenade, carrying a "shaped charge" of high explosive. A cone-shaped cup hollowed in the front face of the explosive filling focussed the blast energy into a narrow beam of great penetrating power.

These rifle grenades had too much recoil for field use as a shoulder weapon. Recoilless rocket propulsion was suggested, tried, and adopted. Colonel Skinner, then an Ordnance Department major, and Lt. (now Major) E. G. Uhl, with Section H at Indian Head, undertook the development of a suitable rocket motor.

Following unsuccessful attempts to launch these rocket grenades from attachments to the service rifle, it was concluded that a separate launcher would be required.

To protect the gunner from the rocket blast, the launching tube had to be longer than the maximum burning distance of the rocket motor. To be portable and easily aimed from the shoulder, the launcher, and hence the burning distance, had to be short. By the use of a charge of several thin-web tubular grains of solvent extruded powder in a motor about an inch in diameter, the burning distance was made short enough for a 54-inch launcher, soon dubbed "the bazooka."

This launcher was designed to be fired from the

★U. S. Rocket Ordnance.

shoulder and to discharge the rocket blast behind the gunner. It could be sighted and swung with a moving target as easily as a rifle.

The first model of this weapon, despite recognized imperfections, was rushed through production in 1942. It was used in the first Allied landings in North Africa. The weapon soon became famous for its tank-stopping power in Africa, Europe and the islands of the Pacific.

As is the case with most new weapons, improvements were necessary and development work was continued at high priority. Blast was particularly troublesome, especially at low temperatures which caused the powder to continue burning after the rocket had left the launcher. This was eliminated by using faster-burning powders. One such fast-burning powder, developed by NDRC's Division 8, was a new solvent-extruded powder containing a high percentage of special ingredients—this powder shortened the burning distance so much, even at extremely low temperatures, that it earned the name of "blastless bazooka powder."

Debut of the Bazooka

This was the weapon whose effectiveness was demonstrated first in the Allied landings in North Africa in 1942, knocking out pillboxes, tanks, and other enemy strong points.

In spite of its short range—it is most effective within 200 yards—the bazooka in the hands of concealed marksmen stopped enemy armor, gave a lift to the morale of the GI, and was feared by the opposition.

The success of the bazooka in action is best indicated in the unadorned stories of the men who used it. From his European combat experience a private recalled: "We had been hard hit and all of our bazooka men had become casualties. This Mark VI tank was really giving us a going over, and something had to be done about it. Although I had never used a bazooka before, I knew how to handle it. So one of my buddies loaded the weapon for me and I crawled up a ditch until I was so close to the German tank (he was within 40 yards) I couldn't miss, and let them have it. That one round really did the trick." The private won the Bronze Star for his feat.

Similarly, a sergeant, a mortar squad leader, had never fired the weapon, but during a savage German counterattack on American positions he halted a German Tiger with two rounds at a distance of 75 yards.

As the heavy tank lumbered toward him spearheading the Nazi attack, the sergeant seized a bazooka dropped by its wounded operator and fired at the track. The tank's machine gun as well as supporting German riflemen opened up on him. He reloaded and sent a second rocket crashing home, immobilizing the tank. The crew abandoned it and doughboy riflemen smashed the counterattack. The sergeant won the Silver Star.

Bazookamen found that their improved weapon frequently performed beyond their expectations. Combat reports tell of holes driven through a 6-foot pillbox wall, of masonry walls blasted with holes big enough for a man to crawl through, of tank crews killed by fragments spalled off the inside of 8-inch armor plating although the shaped-charge did not penetrate the armor.

Bazooka Versus Pillbox

Experience in the Pacific showed that even when the bazooka could not destroy the heavy Japanese pillboxes, its concussion could stun the occupants and give infantrymen an opportunity to rush in and dispatch the enemy at close range. The bazooka was highly effective against Japanese tanks, which were more lightly armored than the German.

In one frantic action on Luzon, soldiers of the 6th Infantry Division fought a close-range battle against Jap tanks, which, firing at point-blank range, were mowing down American antitank gunners as fast as they manned their weapons.

"We tore into them with rifle grenades and bazookas, the only weapons we could use under the circumstances," a sergeant reported. His battalion claimed 57 Jap tanks in the battle.

Combat experience was translated into modifications which made the bazooka a more convenient weapon. A two-piece launcher permitted easier carrying and better concealment from observation than was possible with the original one-piece launcher. A trigger-operated magnetic replaced battery ignition. The sights were improved.

Versatility of the bazooka was increased with the development of a bazooka smoke rocket loaded with white phosphorus; this was effective against Jap bunkers and caves. Ingenious American soldiers projected telephone wire over stretches of exposed ground by fastening the wire to a dummy rocket. They used dummy rockets to carry detonating cables out over minefields where the cables were set off, exploding the mines.

Nazi Imitations

A new step in the development of shape-charge antitank rockets began with the German capture of American bazookas in North Africa, particularly at Kasserine Pass. The *Panzerfaust* and the *Panzerchreck* were German bazookas based upon the American. Appearing some months after the North Africa action, they carried a heavier shaped charge which produced greater penetration, but were lower-powered and lacked the range of the American 2.36-inch rocket.

The American answer to heavier German armor and to Germany's large rockets consisted of the two improved bazooka rockets already mentioned—the super-bazooka and the 3.5-inch rocket.

The superiority of the super-bazooka motor over that of the original bazooka is achieved by the use of an improved igniter and a heavier charge of propellant, the latter consisting of many thin disk-shaped grains, stacked in a stepped-back column to allow freer flow of the gases toward the nozzle.

CARDED

The Intelligence School

by Lieutenant Julius S. Gassner*

THE new Intelligence School at Fort Riley, Kansas, was patterned from the War Department Military Intelligence Training Center, which during the war, at Camp Ritchie, Maryland, mass-produced intelligence specialists. When the Maryland center was inactivated in the fall of 1945, previously made plans were carried through for a peacetime intelligence training center under G-2, Army Ground Forces. Under them the school, after a brief establishment at Fort Benning, Georgia, where adequate facilities were not available, was moved to Fort Riley. Here, on March 29, 1946, the first graduates of the first AGF Intelligence School received their diplomas.

In this first graduating class were 45 officers and 50 enlisted men, who had completed a well-rounded nine weeks' course. The course ended with a 36-hour, continuous command post exercise, during which the students established and operated one corps and four divisional G-2 sections, and two regimental S-2 sections, complete with Photo and Order of Battle teams.

The school has been given the status of an advanced service school, and it is believed it will train about 250 officers and 250 enlisted men during the school year. Major General I. D. White, Commandant of The Cavalry School, and former commander of the 2d ("Hell on Wheels") Armored Division, is also Commandant of The Intelligence School.

The students enrolled in the first course were offered a choice of three specialties: General Subjects, Photo Interpretation and Order of Battle. The nine-week course was divided into periods of three weeks and six weeks. During the first three weeks the students were introduced to two of the specialities—Photo Interpretation and Order of Battle—and received an over-all view of the entire intelligence cycle, from the collection of initial information to the final dissemination of completed intelligence. The comprehensive view thus presented helped prepare them for whichever of the three specialties they chose to take during the last six weeks of the course.

The proportion of students who specialized in Photo Interpretation and Order of Battle was roughly 20 per cent, equally divided between the two. The remaining 80 per cent chose the Department of General Subjects.

Most of the school's work was practical, with a minimum amount of time spent attending lectures. This was especially true in photo interpretation, in which students constructed a 1/5,000 terrain model of the Fort Riley-Junction City area.

The Order of Battle enrollees devoted more than a quarter of their time in working out problems, most of which were based upon actual situations in which original documents captured in the Pacific and European theaters were employed.

In the Department of General Subjects, students observed demonstrations of the function of the various intelligence agencies, went on night patrols, wrote periodic reports, and made observation flights over the surrounding countryside. This gave considerable stability to the extensive background-knowledge and theory which is inherent in advanced intelligence training.

The instructors who were to serve on the school's staff brought with them their own varied experiences, which covered virtually every field in intelligence work —and ranged from an analysis of German flak to scouting and patrolling in eastern New Guinea.

No radical changes have been made in the Second Interim Class of the school which began April 8, and graduates in mid-June.

Beginning in September, 1946, however, courses are to be organized along entirely different lines. An Officers' Course for four and one-half months will be conducted each fall and spring. It will begin with six weeks of training in reconnaissance and observation, which is to be conducted under the supervision of The Cavalry School. This preliminary work will stress the reconnaissance tactics of all arms in every kind of operation. It will include reconnaissance of all types; message writing; occupation and operation of an observation post; scouting and patrolling; and allied subjects. At the conclusion of the course in reconnaissance and observation, all officer graduates will attend the Advanced Intelligence Course, which will be conducted by The Intelligence School. This course will provide, under the Department of General Subjects, instruction in detailed staff duties, intelligence functions peculiar to all arms, the use and integration of intelligence agencies, counterintelligence, air-ground liaison, and allied subjects. The Department of Photo Interpretation will give the equivalent of a three weeks' course in the technique of photo interpretation. Future officer students will spend the equivalent of two weeks of study under the guidance of the Department of Order of Battle.

The purpose of the Officers' Course is to qualify personnel for duty as G-2s and S-2s of units from battalions to divisions, inclusive.

Plans are to offer two specialists courses for enlisted men. The Photo Interpreter Course of six weeks will qualify enlisted men as photo interpreter specialists.

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*Instructor, Department of Order of Battle, The Intelligence School.

Enrollees will receive instruction in basic combat intelligence, military and terrain identification, mechanics of photography, preparation of controlled mosaics, preparation of terrain models, and allied subjects. The combined Order of Battle and Prisoner of War Interrogators' Course, of six weeks, will include such studies as basic combat intelligence, order of battle techniques, and the organization of selected foreign or type armies as well as the technique of interrogating prisoners of war. The course will qualify students as order of battle specialists, and as experts in the technique of interrogating prisoners and processing captured documents.

For demonstrational purposes and as an aid in instruction, the school will employ fully equipped Photo Interpreter, Interrogation and Order of Battle teams as well as a counterintelligence corps detachment.

It is felt that the decision to locate The Intelligence School at Fort Riley is an extremely fortunate one. For both The Cavalry School and The Intelligence School have a common interest in reconnaissance, observation and security, and a coördination of the two schools therefore appears desirable.

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Sand Models

THE latest addition to training at The Intelligence School at Fort Riley, Kansas, is a course in terrain modeling, which calls for speed, initiative and accuracy in the construction of scale models that are perfect to the minutest detail.

The models prepared by the students serve as useful aids for a large-scale intelligence field exercise which is held at the conclusion of classroom instruction.

The models, designed on a scale of one unit to 10,000, are constructed almost entirely of cardboard and sand and their three-square foot sections represent an area normally assigned to a division.

Students are taught to model terrain so that they can give troops not thoroughly schooled in the reading of contour maps an accurate picture in miniature of terrain over which they may operate.

The terrain to be used for the model is projected from a map through a balopticon onto thin paper and from there traced onto the model base.

After contour lines have been drawn on the base, cardboard is cut to form the hill effect on the model. Over the cardboard is spread sand mixed with glue, and the necessary coloring is added to produce the desired effect for trees and other growth.

A bluish or dark green hue is used to designate coniferous trees. The deciduous type of tree is shown in a yellowish or light green tone. To represent trees in spring, more yellow coloring is added; purplish brown tone is used to show trees in the fall; and a rich green in the summer.

All prominent objects on the landscape are shown on the finished model, with each building and hedgerow in its proper place.

Buildings are cut in miniature from wood and glued to the model, and roads and streets are formed by tracing a slight depression in the model base and then sprinkling it with talcum powder. Varying color shades are employed to denote different fields. Light brown may be used to show the location of ripening wheat or a plowed field while a greenish hue may represent an alfalfa field or pasture land.

Preparation of the sand is a tedious job. It must be sifted carefully so that no large pieces are contained in the finished product. The glue must be prepared to the correct consistency, and that is one of the student's many tasks. He has to keep double boilers of glue simmering on the laboratory stove, constantly adding ingredients and forever stirring.

Sand is the principal covering mixture used here, but sawdust, clay, pastelon, plaster of paris, pulverized nutshells, old paper, soft coal dust, ground coral, ashes or cinders are likewise recommended.

Glue is the best binder, but molasses or egg or resin will do just about as well. Sand and glue are the easiest to obtain here, but under field conditions students may be forced to revert to a score of mixtures and binders.

Trees can be made from sand, pebbles, pieces of sponge, Norwegian lichen, small branches, vegetables, paper, wire or a hundred other materials, depending upon the scale of the model and the type of tree.

Paint alone may be used to represent grass, but fine sand, wood flour, cement or any powdered substance will also serve the purpose.

Airborne Possibilities*

by Lieutenant Colonel John H. Swenson, Cavalry**

WITHOUT in any way contradicting or in the least detracting from the epic accomplishments of the airborne forces, an excellent résumé of which was presented by Lieutenant Colonel Cornett in the December 1945 issue of the *Military Review*, I should like to point out that the full possibilities of the arm have by no means been developed.

As was pointed out by Colonel Cornett, airborne forces are the child of the recent war. Their development was the result of a crying need. Hence it was largely determined by the exigencies of the situation. Technical developments, though amazingly rapid, were unable to provide the means for accomplishing all that was desired. This has left the airborne forces with certain inherent limitations, the outstanding of which are a lack of sufficient supporting fire, and a very limited tactical mobility, as well as a precarious and tenuous lifeline of supply.

Toward the end of hostilities, technical developments to overcome these limitations were just emerging from the test stage. They did not emerge fully from the crucible of combat usage. The principal developments referred to are the recoilless rifles and mortars which would have gone far toward eliminating the weakness of limited supporting fire, and the CG 10-A Glider which had the capacity to deliver means capable of providing tactical mobility to airborne forces. The supply situation might well have been remedied by the employment of newly developed technical means of identifying delivery points for air transported supplies.

In order to explain more fully what these remedies can mean in airborne developments, let us now take an hypothetical unit of a truly revolutionary type and consider its capabilities. For this purpose I would like to use a Horse Cavalry Glider Squadron. Let us say that the squadron is composed of a Headquarters, three rifle troops, and a heavy weapons troop. Its armament consists of sabers, M1 rifles, submachine guns, light machine guns, 4.2 recoilless mortars, and 57mm and 75mm recoilless rifles. Let us also assume that it is fully mounted and needs no transportation other than its horses.

The CG 10-A, which was constructed to carry a 6x6 2½-ton truck or 12,450 pounds of freight, makes transportation of such a unit a possibility. In the same space and within the same weight limitations, it would be possible to carry eight mounts with riders or loads. Assuming the combat strength of such a squadron would be 632 men and 800 horses, the squadron could be transported in 100 CG 10-A Gliders.

Now let us take a situation in which it would be feasible to employ any airborne force. The basic requirement is that we have air superiority, or can establish air superiority during the time we are convoying our troops by air, and can either maintain or reestablish that air superiority for a sufficient length of time to enable us to re-supply the airborne troops. The next requirement is that we can reasonably ascertain that the terrain on which we land these troops will be suitable for the landings, and that the area in which these landings take place will be sufficiently remote from enemy installations to enable the troops to assemble and organize before they are attacked in force.

Because the force we are considering is mounted, and each man has in his mount a rapid means of transportation, these troopers should be able to unload from their gliders and assemble or rally in considerably less time than Infantry troops committed to action by the same method. In fact, because of their mobility they might well capitalize on a deliberately dispersed landing. Under certain conditions troops or even platoons might land separately and destroy bridges and communication nets while en route to the squadron rendezvous. Were this done, it would further add to that pandemonium in the defender's mind that accompanies an airborne landing. It seems fair, then, to assume that their chances of success for accomplishing an assembly, the most critical phase of an airborne operation, would be equal to or better than that of any now existing glider unit.

Having then established the feasibility of landing and organizing our theoretical force in enemy territory, let us next turn to their capabilities. The best historical guide to the capabilities of such a force when deep in enemy territory can be found in the history of the Russian Cavalry raids behind the German lines. Although Russian security has prevented us from gaining many specific facts, enough information has seeped through to make it reasonably certain that when Horse Cavalry units were able to place themselves in the rear of the main German battle positions they were able to operate successfully against the highly mechanized and thor-

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**Military Review.*

**Instructor, Command and General Staff School.

oughly modern German war machine. The main factors which enabled them to do this were surprise and mobility, which further contributed to the element of surprise.

Let us now change our role to that of the enemy G-2. Let us assume that we know the foe has a Horse Cavalry Glider Squadron, and that he has sufficient air force to enable him to employ it at this time. If we are to state the enemy's capabilities, we must state that he is capable of attacking with a strength comparable to one battalion at any point within an arc the radius of which is the operational radius of his transport aircraft and the center of which is his forward air bases. You must remember that you are the enemy G-2. Imagine your Commander's reaction to your profound pronouncements! Will he attempt to allocate sufficient troops to guard each and every vital area and installation within this area? Can he afford to? Will he build an unbreachable antiaircraft screen against this threat? He will undoubtedly try, but unbreachable static defenses have not yet proven practical. Will he, or indeed can he, construct obstacles which will render all possible glider landing fields unusable? Can he afford to ignore this capability?

Now let us reverse the situation and change our hats once again so that we become staff officers of an invasion force about to strike Northern Europe. In order to bring this closer to home for more of us, let us consider that it is late May 1944, that our forces are marshaled and poised for the invasion of Normandy. Assume that late one afternoon we receive information that hostile horse glider forces have landed in a specific area. When we consider the probability that this glider landing would be coordinated with diversionary and deceptive measures, we might well allow several hours during which we would be uncertain as to the actual location of the glider landings. At any rate, if the landing areas had been well selected and the operation well timed, it would be impossible to counter this action before nightfall. This, then, would leave us confronted with the task of ascertaining their capabilities for the period between their landing and daybreak the following morning.

Based on known Horse Cavalry actions, it is fair to assume a rate of cross-country march during darkness, off roads, and without benefit of bridges, of four miles per hour.

With ten hours between the landings and daybreak of the following day, this enemy force, which depends on neither roads nor bridges, might well evade our best efforts to fix and destroy it. It appears patent that we can no more ignore this small but potent force than could a man who suddenly realized he had a hornet in his trousers ignore that hornet.

We would immediately have to move sizable forces, forces in the process of embarking for an invasion, to protect all vital installations, bridges, communication, and transportation centers as well as headquarters. In addition, we would have to alert all troops within possible striking distance.

Next, we would have to set about to fix and destroy this enemy. Considering his independence of roads and bridges, this would be no small task. In addition to the usual advantages that accrue to the force with both the initiative and mobility, he would have in his favor the fact that forces sent against him would be loath to employ usual aggressive measures in friendly territory. This same condition would almost limit the employment of air forces to a role of reconnaissance.

True, the squadron would have to contend with a hostile civil population. Hence, their movement would continually be opposed and their progress reported. However, judicial and systematic destruction of communications and mining of roads (all part of raiding technique) should go far toward neutralizing the information services spontaneously performed by civilians. Civilian opposition, even considering the Home Guard (good though it was), could hardly do more than harass an organization with such flexibility and cross-country mobility. Hence, it would be necessary to commit a large number of the invasion troops to the mission of locating, fixing, and destroying this squadron.

The eventual outcome of the hunt will not be argued. Certainly the quarry would eventually, and perhaps rather speedily, be brought to bay and smothered. Yet it seems just as logical that before we can corner him, he will have committed considerable and probably serious depredation. However, reflecting upon the closely controlled and clocklike precision of both troop and supply movements so essential during the critical period just preceding and during embarkation for an invasion, it would appear that the greatest damage would grow out of the disruptions and dislocations that his presence would have caused. In fact, we are reminded of Aesop's fable in which the ant bit the hunter on the ankle and disturbed his aim, thereby saving the life of the elephant.

As indicated, this hypothetical operation would eventually come to a bad end. This would be because it lacks the essential element of *mass*—without which all airborne operations eventually become a struggle for existence. Nonetheless, it does illustrate the advantages that accrue to an airborne force when to that force's strategic mobility we add tactical mobility. Mass can be added. If and when it is, logistic support can be provided. We have the means if only we are willing to pay the price.

It is realized that to do so is an expensive proposition, and that both extreme selection and extensive training would be necessary for the establishment of any force capable of exploiting the characteristics portrayed in the example. Yet, would not the results logically expected of them justify their creation within the armed forces of a nation possessed of the material resources capable of their support?

BURMA TRIUMPH★

by Squadron Leader Charles Gardner

ONE of the least known of the theaters of operations in World War II was that of the Southeast Asia Command. The story of the conflict in that theater has yet to be told, but when it is the struggle and eventual victory in Burma will be given an appraisal it well merits. Here was fierce and rugged campaigning that tested the strategical genius of the Allied command and the valor of our fighting men.

Three years of fighting over the devil's own country was finished on May 5, 1945, when the British captured Rangoon and hoisted the Union Jack over Burma's capital. For three and a quarter years the city had been in Japanese hands and had been a focal point in the "Greater Southeast Asia."

When Admiral Mountbatten came to his newly created Southeast Asia Command in the late autumn of 1943, the problems facing him seemed well-nigh insurmountable. Our forces were meager, our responsibilities great.

The Japanese were firmly "in" all over Burma, with great jungles and sprawling mountain ranges forming a buffer against any major Allied attack. A 200-mile belt of the world's thickest natural barrier and two great rivers protected them in the Central Burma plain. Through these ragged mountains and steaming, overgrown valleys there ran, from our side, but two roads and no railways. The Japanese, it seemed, could stay contentedly on their side of the Chindwin, nourished by good internal lines of communication which stretched back to the major port of Rangoon.

On the other side of the jungle barrier—our side—the picture was different. We had no nourishing network of roads and railways, no kindly port close at hand.

Where was *our* supply base?

At Calcutta, 900 miles back! Linked to our fighting front by but one railway, the Bengal-Assam line, already heavily laden with supplies to be flown to China; charged, too, with supporting General Stilwell's drive to reopen a land route to Chungking. What was more, there could be no relief from this state of affairs until we held Rangoon. For the whole of the next 1,300 miles of advance it seemed as if we were doomed to be tied to Calcutta.

Mountbatten took one look at the position and summed it up in a sentence: "the biggest logistical nightmare of the war."

How the Japanese must have smiled when they heard that! How safe they must have felt.

What could the British do? We had the weakest lines of communication that any army had ever had to fight from. We had no roads or space by which to deploy our superior equipment—when we got it. We were sealed off from Central Burma by trackless mountain and jungle. We were vulnerable to sudden attack from across the Chindwin.

On the face of it, then, all that the Japanese had to do was to sit tight, build up supplies on the Chindwin banks and then strike at India through the jungle of which they believed themselves to be all-time kings.

Yet, by May 1945, their dream was shattered. So were three Japanese armies and a Japanese Air Force! Over 120,000 of the Emperor's best troops were dead and Burma was British again.

How did it happen?

The story which follows is an uncolored, simplified account of one of the greatest military campaigns in the history of war. This campaign was planned audaciously, and carried through with courage and resolution by three British Imperial Corps of troops, one Anglo-American Air Force and a few divisions of Chinese, all supported by the big and little (but mainly little) ships of the Royal Navy and the Royal Indian Navy.

The first hurdle Mountbatten had to clear was that of the supply line. The solution of the problem of distance and lack of roads and railways was apparent to all the senior officers—to the "Supreme," to General Slim, GOC of the 14th Army, to Wingate. It was air supply.

"Bring your goods down the chimney," said Wingate, "there's no future on the jungle floor."

And so, painfully (for there were many urgent and competing demands on Allied production) a fleet of Dakota transports was gathered together. Squadron by squadron, British and American, they were assembled behind the lines, in India.

Said the Air Force Chiefs: "Before we can run this fleet of unarmed 'merchant ship' aircraft we must sweep the skies clear of Japanese fighters. The transports can't operate in the face of fighter opposition. First things first: we must gain complete air supremacy, or, further than that, we must have air monopoly."

So, gradually, the combat as well as the transport side of the Air Forces was built up. Spitfires, Mustangs, Beaufighters and Lightnings began to trickle through. Few enough they were, the bare minimum, but enough.

More detailed planning was not possible. The main airfields for the air-lift which was to beat the jungle

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★*Military Affairs, Journal of the American Military Institute.*

were chosen. Bases in India and near the railway were earmarked for the first phase, and it was decided to supply from the Arakan ports and over the Somra mountains for the second phase or the "Central Burma" advance. The complicated organizations for the building of airfields and for the sorting and loading of stores were worked out.

For the purposes of this account, I will set on one side the Northeast Burma campaign of 1944 to 1945: the Stilwell-Wingate offensive which cleared the ground through Myitkyina and Bhamo to China. This important task was S.E.A.C.'s first charge on its charter, and it was a task triumphantly carried out. The first convoy went through to China in January 1945. This Northeast Burma fighting, however, was not concerned directly with the liberation of Central Burma, although our forces there naturally tied down Japanese troops and resources. What must be remembered, however, is that from March 1944, until the monsoon, Wingate's men were "in," and were a major standing charge on our air supply—a charge which had to be fulfilled, for the Chindits had no other resources save those which came by air. They were 200 miles behind the enemy lines.

Let us return then to the central theme: our planned offensive over the Chindwin.

As the air supply of Phase Two of the liberation depended on the Arakan ports of Chittagong and Akyab, those ports had to be freed from enemy menace. That was why, in early 1944, the 15th Indian Corps was pushing down Arakan toward Akyab. About the same time, the Air Forces began their long-term program of clearing the air to prepare for the Dakota "merchant shipping."

But, just as this preamble to our plans was under way, the uncooperative Japanese altered the shape of our commitments. They launched two major attacks toward India: the first in Arakan, where we were getting dangerously close to Akyab, and later, in the Central sector, at Imphal.

These two attacks had both been foreseen, and provided against, but they had the immediate effect of making us follow an enemy lead. In the long run, they speeded the whole business of the recapture of Burma but, for the time being, we lost the initiative.

In Arakan, the Japanese were decisively beaten, but only after they had completely surrounded the 7th Indian Division. The enemy's protecting air force was shot down and so mauled that it withdrew from the struggle early, and the Dakotas kept the isolated 7th going until they were relieved from the north, and a great slaughter of Japanese was made.

Result: on the whole beneficial to us and our plan. Many Japanese fighter aircraft were put out of the way, which saved us the trouble of seeking them out to destroy them, and the road to Akyab was made easier by the weakening of the enemy forces.

But right on the heels of this defensive victory of ours, the Japanese plunged into their Imphal-Kohima show. This was their big push—and a pretty stroke it would have been had it come off. It aimed at bursting into India, and cutting the Bengal-Assam railway line above Kohima, leaving Stilwell and his China road project on the end of a sawn-off limb. En route it would have destroyed the 4th Corps of the 14th Army and might have found the road to Calcutta more or less open.

The Japanese were convinced that success would be theirs. "On to Delhi," cried their radio, and there was no doubt that the shot was, as they say at billiards, "on."

General Slim, however, had seen the Jap chalking his cue for this "winning hazard" for some time. As the enemy surged round Imphal and isolated Kohima, he saw that, if we could hold those two places, this Japanese offensive would be the turning point of the Burma war. What appeared to be a serious reverse to our plans was, in fact, a golden opportunity that would speed up the whole process of liberation—providing Imphal and Kohima were held.

And they were!

The story of that struggle is yet to be told. The air supply machine took over and maintained a daily commitment of over 500 tons at Imphal. The fighters progressed yet further in their long-range task of destroying the Japanese air force, which again came out for a short time and then retired. The Dakotas had a full-scale tryout for air supply and troop movement. During the struggle they moved the 5th and 7th Indian Divisions complete from Arakan to the Chindwin battle. This removal of two of its divisions weakened 15th Corps which was not then in a position to follow up the defensive victory of February with the capture of Akyab before May and the monsoon. Thus their Imphal offensive kept Akyab in Jap hands for a further ten months, but this was now academic, as enemy offensive power in Arakan was broken and Chittagong, the main Dakota port for Phase Two, was no longer in danger.

By mid-June, the Imphal battle was over. The Japanese had lost heavily and had taken crippling casualties without gaining a thing. We, on the other hand, had done more than merely deny the enemy. We had proved the possibilities of air supply. We had killed the Japanese air force (prerequisite number one for the coming Dakota operations in Central Burma) and, on the west coast, we had secured an unmenaced Chittagong. All these benefits had accrued to us as by-products of two defensive actions.

Air Marshal Joubert, in March 1944, when the Japanese were at Kohima, said, "This is the enemy's big mistake. He has come to us and so saved us the difficult and costly business of going into the jungle to find him." He was now proved to be right.

As the monsoon started, the enemy, broken, starving and disorganized, fled back into the jungle belt.

It was an opportunity not to be missed—one of the great opportunities of war. Rain or no rain, the pursuit was on. Spearheaded by the 5th Indian Division, our men pushed through the jungle, down the mudbath called the Tiddim road, and also down the Tamu road, a monument to our engineering skill. Once again, Dakotas brought the supplies and took out the wounded. The Japanese fled, fighting rearguard actions but still bewildered and defeated.

It was our troops now who were "King of the Jungle." The results of Slim's farsighted training plans, and the inspiring feats of Wingate in Northeast Burma were proving to the world that Japanese invincibility was a myth.

By the end of the monsoon, we were virtually through that jungle belt which the enemy had regarded as an impregnable safety zone in which he only could mount an attack. By November of 1944, we were across the Chindwin and, before us, was the "promised land"—the Central Plain, with the Chindwin and then Irrawaddy valleys flowing flat and invitingly southward to Mandalay and Rangoon.

This was the kickoff for Phase Two.

Six months of good weather lay ahead, there was room to deploy, and the base port of the air lifeline in Arakan was secure. The Japanese air force was already "out," and, in the northeast, Stilwell was practically through to China.

There was one danger—there could be no drawing back. Once the 14th was on its way south, it had "burned its boats." Every yard gained was a yard farther away from the port of Calcutta. There could be no relief from that dismal fact until Rangoon.

In other words, if and when the 14th reached the gates of Rangoon, it would be 2,000 impossible miles from its base port. *It would be entirely dependent upon the Dakotas. If their organization failed or if the safety of Rangoon was not reached before the monsoon of 1945, the whole 14th would be out in the blue.* Air supply might not be able to maintain the Army in South Burma in monsoon conditions, and a "bogging down" short of the objective could easily be the prelude to major disaster.

Mountbatten, Leese and Slim knew the risk, but it was one which had to be taken sooner or later, and now was the time to take it. So, in December, the 14th came over the Chindwin. The die was cast!

General Monty Stopford's 33d Corps crossed at two places, with the 2d British and the 19th and 20th Indian Divisions working together at the start of the plan which was to bring us to Mandalay. The 19th Division, after crossing the river, kept on due east to the Irrawaddy. The 2d Division and 20th Division turned south into the Burma plain. They, too, were headed for the Irrawaddy, but at the point where it bends westward from Mandalay and runs due east and west for 60 miles before turning back again on to its southerly course for Rangoon. On their way they captured the Kabo weir intact—a vital achievement this, as the weir is the basis of irrigation for that great rice-growing plain.

It was now that the 14th Army changed from a jungle to a desert army—not because Central Burma is a desert, but because militarily many of the problems are the same. The open spacious plain lent itself to Libya-like tactics.

Here, able to see 20 miles at a glance instead of 20 yards, they switched all their tactics to the new conditions. Great battles were fought. But by now, our superior equipment could have a real chance: the tanks, the carriers, the armored cars and our aircraft.

The Japanese tried the old stuff—foxholes, trenches and fanatical resistance—but Slim's men cut and thrust round them, forced the Irrawaddy, two to four times as wide as the Rhine, and swept on. And with them, however fast they moved, went that other half of Mountbatten's Burma forces, Eastern Air Command and the all-important Dakotas of Combat Cargo Task Force.

By the middle of January, 33d Corps was crossing the Irrawaddy, the largest of the river barriers. Nineteenth Division, after bloody battles, reached the east side of the river, north of Mandalay, while 2d and 20th Divisions crossed west of Mandalay, over that section of the river which runs east and west. All these crossings were heavily opposed and our bridgeheads heavily counterattacked.

This was a "touch and go" period. On the 2d and 20th Divisions' side of the battle, our flank was wide open to crippling counterattack. That counterattack was never launched. General Stopford in his tactical appreciation had forecast that the Japanese would not realize the weak position of the British flank, and he was right.

With the bridgeheads consolidated, two strong forces moved on Mandalay from the north and west. Nineteenth Division, under Major General Rees, got there first and took the city. Fort Dufferin fell on March 30. The time for the big drive south to Rangoon had arrived.

There was less than two months to go before the monsoon, and 350 miles of enemy-held country to cross. The 14th Army had to average over six miles a day to set the seal on the victories of the previous 12 months.

It was now that General Slim made his surprise stroke. As the three divisions of 33d Corps regrouped in the Mandalay area, he threw in against the bewildered Japanese another corps of the 14th Army.

The 4th Corps under Lieutenant General Frank Messervy had for some time been assembling secretly near the Irrawaddy at Pakokku. From there it made a brilliant dash across the river and flung an armored column 90 miles to the southeast to seize Meiktila. An airborne column was at once flown in, in support. The Japanese south of Mandalay now had their escape road to Rangoon cut and, after a bitter battle for Meiktila, 4th Corps plunged southward toward the Burma Capital. Meanwhile 33d Corps having regrouped moved across to the western flank and also began a drive toward Rangoon down the axis of the Irrawaddy river. It is doubtful if, for some time, the Japanese realized that they were facing twin drives on the capital, each drive being of a corps' strength.

Fourth Corps, especially geared for speed, with airborne and motorized brigades, leaped down the railway toward Rangoon at an average speed of over 15 miles a day, and by the beginning of May was only 20 miles from the port. Then, on May 2, 1945, Mountbatten sealed the fate of Rangoon. With the monsoon rains already threatening, he launched an airborne and amphibious assault to which the Japanese had no answer.

Troops of the 26th Indian Division captured Rangoon on May 4 and a few days later linked up with Messervy's 4th Corps drive.

The great plan had worked. We had brought our forces 1,300 miles from Imphal on a main basis of air supply. To do it, something like 200 Dakota strips had to be built by British and Indian engineers. The army routine had been to consolidate, build an air strip, receive supplies, and move on. Toward the last days of the campaign, Combat Cargo Task Force was carrying nearly 3,000 tons a day to the 14th Army, and in addition was moving something like 12,000 troops a week.

At the war's end, Southeast Asia Command stood on the threshold of new achievements. Mountbatten was master of the seas and skies. On his right flank, MacArthur reached Borneo. And the strangulation of Japan and of the troops in the territories she had stolen took shape.

* * * *

Three Years of Jap Imprisonment Little Affected Minds of Americans

From a Report to The Surgeon General

THREE YEARS in Japanese prison camps, most of the time on starvation rations and subjected to frequent beatings, had surprisingly little effect on the minds of more than 4,000 American soldiers who survived the ordeal.

Wherever these men landed in the United States after liberation they were met by teams of medical specialists assigned from the Office of the Surgeon General. A report on the neuropsychiatric findings has been made by Lieutenant Colonel Norman Q. Brill, who was in charge of this phase of the examinations.

Tremendous Will To Live

Considerable importance was attached to early medical contact with the released soldiers because, said Dr. Brill, "never before in this country's history had such a large group been exposed to starvation, torture and humiliation." The psychiatrists were interested in the factors that were responsible for the survival of these men when so many of their comrades, in about the same physical condition when captured, had succumbed. The nearest they came to finding a common factor, however, was what is described in the report as a "tremendous will to live." Otherwise the soldiers differed in about every possible way.

"All of them," said Colonel Brill's report, "lived only for the day. Indeed when one of them would fail to concentrate on or begin to hoard food, or gave way to morbid thoughts concerning the seemingly hopeless situation, he was earmarked by his companions as quite likely to die shortly. A prisoner who would hoard his rice allowance for several meals in order to enjoy the sensation of one large meal was referred to as 'rice happy.' This was generally an indication of the beginning of deterioration and early demise.

Courage The Best Explanation

"When those of lesser spiritual strength became ill they were likely to give up, quit eating entirely, and frequently would die within a few days. One fails to find a scientific reason or an adequate term to explain survival. It seemed to some of the examiners that 'courage' was the best word. It seemed that the only common factor among the survivors was that they had courage. They never stopped in their struggle for survival. They ate anything available, including cats, dogs, silkworms and other things repulsive to normal human beings. When struck with dysentery and malaria they would nevertheless attempt to carry on. This strength and courage had no connection with social background or education."

The men themselves expressed no concern about their ability to readjust to life in the United States. Regardless of the future, they felt, they would meet any situation likely to arise after living through the prison camp years.

Japanese Horse Cavalry

by Major Hal D. Steward★

NEWS DISPATCHES from Northern China at the end of World War II reported that the Russians had captured 17,500 horses from the Japanese Army in that region. Recently revealed Jap documents establish the fact that these horses came from two Japanese cavalry brigades that had been stationed in Northern China all during the war. One of the brigades had been in Manchuria since 1932.

The two Japanese cavalry brigades were the Third Brigade (mounted) consisting of the 23d and 24th Cavalry Regiments, brigade artillery, a machine-gun unit of two companies, a signal unit and a transport battalion; and the Fourth Cavalry Brigade (horse-mechanized) composed of the 25th and 26th Cavalry Regiments, brigade artillery, a machine-gun unit of two companies, a signal unit and a transport battalion. Both brigades, according to Japanese Tables of Organization, had more than 3,000 horses.

The last report on the Third Brigade before the close of World War II was that it was carrying out security measures and reconnoitering the movements of the Soviet Army in the Usuri (Phonetic) region in Northern China. In all probability this unit was captured by the Russians while carrying out this last reported mission.

The Fourth Brigade was last heard of while carrying out a security mission in the Keihansen region of North China. It too was probably captured by Russian troops in North China engagements.

Following is a brief history of these two Jap cavalry bigades. The Third Brigade in 1939, was transferred to the Eastern Border of Manchuria from Morioko and was stationed in the vicinity of Hitoku. In the same year, the "Homohan Incident" unexpectedly occurred and the brigade was ordered to mobilize and advance to the Mongolian Plain to participate in the "Russo-Japanese Clash," however, the "Clash" came to an end while the brigade was en route. The brigade returned to Hitoku and was transferred to Takarawan (about 100 kilometers north of Hitoku). Here, the brigade was assigned the mission of reconnoitering movements of the Soviet in the Usuri Region until the end of the war.

In 1931, the "Manchurian Incident" occurred and the following year the Fourth Brigade was ordered to Manchuria. For the next two years, the brigade participated in the subjugation of the Rebel Army in various sections of Manchuria, and achieved great success, especially at Jehol. Later, the brigade was stationed at Tonan and at Hailer where it carried out unit training. In 1937, the "China Incident" took place and the following year the brigade advanced from Hailer into North China, where it was stationed at Hyukaisenjo Kitoku. Shortly after, the "Hankow Operation" in Central China began, and the brigade participated in capturing Hankow. After this campaign, the brigade was active in various operations in Central China and contributed to the defeat of the enemy. After the beginning of the Second World War, the brigade advanced in the direction of North China, where it was assigned the mission of security in the Keihansen Region until the end of the war.

Over a period of years before World War II high-ranking Jap officers, according to all reports, had argued over the advisability of completely mechanizing the cavalry. Several viewpoints were taken as to the degree of mechanization necessary, but, upon experimentation with organization and equipment, the Japs decided it was necessary to retain some Horse Cavalry to be used for reconnaissance.

Until World War I, Jap cavalry, as a reconnaissance branch of the army, was chiefly Horse Cavalry and was included within the general organization of a division. The Horse Cavalry served the division on missions concerned with short-range reconnaissance, liaison with neighboring units, and security patrols in enemy territory. This type of cavalry (generally known as divisional cavalry) was organized as a comparatively small regiment composed of two or three troops. Jap experimentation showed that mechanization of the cavalry was necessary, from the various standpoints of speed, combat power, and endurance—the Russian use of horse troops by the thousands to the contrary. Although Horse Cavalry was found by the Japanese to be weak and not suited to modern warfare, there was strong opposition from many high-ranking Jap officers as to the complete abolition of Horse Cavalry.

Thus, Horse Cavalry units, motorized units, and armored units were combined to form a unit known as the division reconnaissance unit, and the three types of cavalry were to be employed in accordance with the type of terrain encountered.

Following is a chart of the various types of organization of the division reconnaissance unit:

Type "A" (KC) Rcn. Unit

1 armored company
1 Horse Cavalry troop
1 motorized company

Type "B" (OTSU) Rcn. Unit

1 armored company
2 Horse Cavalry troops
1 motorized company

★Press Branch, War Department Bureau of Public Relations.

Type "C" (HEI) Rcn. Unit

1 armored company	2 Horse Cavalry troops

The above types of organization were actually employed in combat after the "China Incident," according to Japanese sources, in the following manner:

"1. In the event that favorable terrain or good roads are present, the motorized unit, utilizing its speed, will precede the other units, occupy strongpoints, and reconnoiter the terrain and the enemy's position. The armored unit will follow the motorized unit and augment its combat power. In this situation the movement will not depend upon the Horse Cavalry because of its inability to maintain the same rate of speed as both the motorized and armored units.

"2. In the event that poor roads or unfavorable terrain are encountered which would hinder the advance of the motorized units, the armored unit will precede the other units and will be followed by the Horse Cavalry unit which will conduct further reconnaissance. In this situation the motorized unit will proceed at a reduced rate and will constitute a reserve.

"3. In the event that it is possible to use the Horse Cavalry unit, the motorized unit, and the armored unit simultaneously in combat, the motorized unit will usually dismount from its vehicles and carry out a frontal attack on foot. The Horse Cavalry unit will maneuver over the difficult terrain and reconnoiter, or attack the flank or rear of the enemy. The armored unit will support either the Horse Cavalry unit or motorized unit in attacking and destroying the enemy, or in carrying out reconnaissance, in order to accomplish the mission of the division reconnaissance unit.

"Although the mission of the reconnaissance can be accomplished by the aforementioned method, the result of the whole operation, of which the reconnaissance is a part, will not be completely successful because the reconnaissance units do not have sufficient strength to completely crush the enemy resistance and still reconnoiter the situation to the rear of the enemy."

Leading Japanese military leaders put forth the following arguments in favor of Horse Cavalry:

"The fact that cavalry activities were limited in World War I was due to the special nature of the combat area. When large armies are being deployed in a small area such as Europe there is hardly space enough to use cavalry groups in the proper manner. The difficulty in handling cavalry is not inherent to it as a particular branch of the army. The combat area in which Japan expects to use its armed forces is the large continent of Asia. Europe is not comparable to Asia in size. Therefore, the cavalry can be expected to fulfill its function in the Japanese Army.

"Fire power can be increased by future effort. But it cannot be concluded that in every case battles will be won quickly by decisive frontal assaults. Many instances will arise in which encirclement, flanking movements or raids will be the deciding factor. Mobile forces will be absolutely essential for these purposes. Hence the cavalry is indispensable."

It should also be added that it was difficult for Japan to organize a sizable mechanized cavalry force rapidly because of handicaps in mechanical ability and iron resources.

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New Regular Army Officers

The Armored Cavalry Journal takes great pleasure in welcoming these officers who have successfully passed the examinations for the Regular Army and have been appointed therein.

THE officers listed below were nominated by President Truman for permanent commissions in the cavalry branch of the Regular Army. They are among the 9,831 chosen from more than 100,000 applicants. The grade given each officer in the following list is his permanent grade in the Regular Army. In practically all cases the officers hold higher temporary commissions in the Army of the United States.

1st Lt. (Lt. Col.) David D. Klous, 3000 39th St., N.W., Washington, D. C.
1st Lt. (1st Lt.) William J. Lynn, PO Box 744, Anniston, Ala.
1st Lt. (Maj.) A. T. Netterblad, Jr., Box 287, Miami, Ariz.
2d Lt. (1st Lt.) Alfred P. Jelley, 1038 East Fourth St., Tucson, Ariz.
1st Lt. (Lt. Col.) Willis G. Ethel, Box 2417, Bisbee, Ariz.
1st Lt. (Maj.) John M. Davis, 17 W. Missouri Ave., Phoenix, Ariz.
1st Lt. (Lt. Col.) Edgar T. Guenther, Box 111, Whiteriver, Ariz.
Capt. (Lt. Col.) John D. Striegel, 511 South Hill St., Globe, Ariz.
1st Lt. (Lt. Col.) Cecil Snoddy, 528 North Plumen Ave., Tucson, Ariz.
1st Lt. (Maj.) Eugene L. Keeth, Box 506, Wilcox, Ariz.
Capt. (Lt. Col.) Maurice E. Webb, 719 N. First Ave., Tucson, Ariz.
1st Lt. (Maj.) Art H. Davis, 908 E. Forth St. Tucson, Ariz.
Maj. (Col.) Carl N. Smith, 1808 E. Edison, Tucson, Ariz.
Capt. (Col.) Charles B. Layton, 509 First Ave., Safford, Ariz.
1st Lt. (Maj.) George R. Dunn, Lake Village, Ark.
1st Lt. (Capt.) Joseph W. Jarvis, Dept. of Natural Resources, Div. of Fish and Game, Ferry Building, San Francisco 1, Calif.
1st Lt. (Lt. Col.) Frank M. Muller, 3459 Divisadero, San Francisco, Calif.
2d Lt (Capt.) Jack P. Libby, 4317 Garthwaite Ave., Los Angeles, Calif.
Capt. (Capt.) Victor B. Fox, 1125 Butte St., Redding, Calif.
1st Lt. (Maj.) Warren M. Hargrave, 1250 Lincoln Ave., Palo Alto, Calif.
1st Lt. (Capt.) Martin O. Soresen, 861 Sutter St., San Francisco, Calif.
1st Lt. (Lt. Col.) Leroy F. Clark, Jr., Box 544, Palo Alto, Calif.
2d Lt. (1st Lt.) James R. Drew, 311 Meyers Place, Inglewood, Calif.
1st Lt. (Lt. Col.) Claire S. Curtis, 348 Orange, Long Beach, Calif.
1st Lt. (Col.) George S. Downer, Rancho De Los Olivos, Los Olivos, Calif.
2d Lt. (1st Lt.) Jack MacFarlane, 8261 Romaine St., Los Angeles, Calif.
1st Lt. (Capt.) Donald F. Isaacson, PO Box 272 West End Station, Colorado Springs, Colo.
Capt. (Lt. Col.) Donald M. MaeWillie, 7 Meadowbrook Road, Darien, Conn.
1st Lt. (Capt.) Jewett A. Dix, Fairfield, Fla.
Maj. (Lt. Col.) Thomas H. Sills, 403 Seybold Building, Miami, Fla.
Capt. (Lt. Col.) Wilburn L. Strickland, Carrollton St., Buchanan, Ga.
1st Lt. (Maj.) Thomas H. Stewart, 615 Crestridge Drive, Atlanta, Ga.
1st Lt. (Capt.) Harry J. Davis, 584 N. Milledge Ave., Athens, Ga.
1st Lt. (Lt. Col.) Walter B. McKenzie, Montezuma, Ga.
1st Lt. (Maj.) Harmon L. Boland, 208 2d St., Ocilla, Ga.
1st Lt. (Lt. Col.) John W. Yow, 2006 North Patterson St., Valdosta, Ga.
1st Lt. (Capt.) Jonathan R. Burton, 3509 Kenilworth, Berwyn, Ill.
Capt. (Capt.) William L. Blake, 462 Sperry St., Bushnell, Ill.
1st Lt. (Maj.) Charles E. Wright, 311 9th Ave., Sterling, Ill.
2d Lt. (1st Lt.) Milford L. Killian, Jr., Trenton, Ill.
1st Lt. (Maj.) Herman M. Marlow, Wyanet, Ill.
Capt. (Lt. Col.) Hal C. Pattison, Alexis, Ill.
1st Lt. (Capt.) William J. Walker, 1325 Sage St., Evanston, Ill.
1st Lt. (1st Lt.) Robert H. Von Burg, 1314 North 5th St., Quincy, Ill.
1st Lt. (Capt.) Gerald V. Reberry, 507 South Locust St., Jefferson, Iowa.
Maj. (Lt. Col.) William G. Eldridge, 809 N. Iowa Ave., Washington, Iowa.
1st Lt. (Maj.) Robert W. Green, 4033 Fagen Drive, Des Moines, Iowa.
Maj. (Lt. Col.) Glen L. Schmidt, 422 Belmont Court, Waterloo, Iowa.
1st Lt. (Capt.) Robert E. Honeyman, Madison, Kans.
Capt. (Maj.)Eugene J. Field, 22B Sheridan, Fort Riley, Kans.
Capt. (Lt. Col.) Wheeler G. Merriam, 14B Forsythe Ave., Fort Riley, Kans.
Capt. (Lt. Col.) Peter H. Dahmlow, The Cavalry School Mess, Fort Riley, Kans.
Capt. (Capt.) Franklin L. Quinton, Schwartz Apt., Junction City, Kans.
Capt. (Maj.) Wendell M. Broadus, Reading, Kans.
1st Lt. (1st Lt.) John S. Nickell, 133 Cherokee Park, Lexington, Ky.
1st Lt. (Lt. Col.) Wm. C. Rountree, 224 Poplar Drive, Elizabethtown, Ky.
Capt. (Lt. Col.) John R. Dey, c/o PM, New Orleans, La.
Capt. (Maj.) Eugene G. Hite, Box 8, Rising Sun, Md.
1st Lt. (Capt.) Clayton N. Gompf, Providence Road, R.F.D. 6, Towson, Md.
1st Lt. (Capt.) William R. Cory, 4710 College Ave., College Park, Md.
Capt. (Lt. Col.) Briard P. Johnson, 11 Pine St., North Amherst, Mass.
1st Lt. (Maj.) Arthur C. Avery, 19 Cosby Ave., Amherst, Mass.
1st Lt. (Capt.) James T. Burke, 26½ Summer St., Ipswich, Mass.
Capt. (Lt. Col.) Leslie D. Goodall, 49 Glen St., Holyoke, Mass.
1st Lt. (Capt.) Albert W. Aykroyd, 2 Warden St., Worcester 4, Mass.
1st Lt. (Maj.) Robert B. Crayton, 9 Newcomb St., Arlington 74, Mass.
1st Lt. (Maj.) Donald H. Cowles, 5 Cottage St., Fairhaven, Mass.
1st Lt. (Lt. Col.) Calvin S. Hannum, 58 Converse Ave., Malden 48, Mass.
Capt. (Maj.) Ritchie Garrison, 181 Pine Ridge Road, Waban 68, Mass.
Maj. (Lt. Col.) Arthur T. Kirley, Hayden Rowe St., Hopkinton, Mass.
1st Lt. (Maj.) Floyd W. Townsley, Valley Road, Ashfield, Mass.
Maj. (Lt. Col.) Rosewell H. King, R.F.D., Uxbridge, Mass.
2d Lt. (2d Lt.) Leslie E. Shumway, 31 Rollinson Road, Worcester, Mass.
1st Lt. (Capt.) Ian F. Turner, 232 Washington St., Weymouth, Mass.
1st Lt. (Lt. Col.) Clifford A. Curtis, 75 East Main St., Hopkinton, Mass.
1st Lt. (Capt.) Richard F. Briggs, Hanover Center, Mass.
Capt. (Lt. Col.) Jerome L. Spurr, 62 Fiske Road, Wellesley Mills 82, Mass.
Capt. (Capt.) John H. Gibson, 15361 Prest Ave., Detroit, Mich.
1st Lt. (Maj.) Urcel L. Bell, 473 Pavone, Benton Harbor, Mich.
1st Lt. (Lt. Col.) Rudolph Barlow, Allegan, Mich.
1st Lt. (Lt. Col.) Ralph L. Dickie, Box 348, Manistique, Mich.
1st Lt. (Lt. Col.) Gilbert O. Wymond, Jr., 1430 Siminole St., Detroit, Mich.
Capt. (Maj.) Weldon L. Slisher, R.F.D., Bronson, Mich.
1st Lt. (Maj.) Thomas J. Howard, Wheaton, Minn.
Capt. (Lt. Col.) Leonard E. Engeman, Long Lake, Minn.
1st Lt. (Capt.) George D. Jacobson, Hutchinson, Mo.
Capt. (Lt. Col.) Carrol B. Henderson, Lathrop, Mo.
Maj. (Lt. Col.) Robert D. Durst, 634 Landers Bldg., Springfield, Mo.
Capt. (Lt. Col.) S. D. Slaughter, Jr., 7508 Main St., Kansas City, Mo.
1st Lt. (Lt. Col.) Dan S. McMillin, 7809 Madison St., Kansas City, Mo.
2d Lt. (Capt.) Milton R. Buls, 704 S. Second, Seward, Neb.
2d Lt. (1st Lt.) William W. Gist, 520 S. Vine, North Platte, Neb.
Capt. (Capt.) Walter M. Meier, 5017 Capitol Ave., Omaha, Neb.
1st Lt. (Capt.) Raymond W. Weeks, 185 Jones Ave., Portsmouth, N. H.
1st Lt. (Capt.) Robert B. Reppa, 345 Hillside Place, South Orange, N. J.
1st Lt. (Maj.) Alexander J. Rankin, 7 Chestnut St., East Orange, N. J.
1st Lt. (1st Lt.) Frank A. Penn, 136 Dalton St., Roselle Park, N. J.
1st Lt. (Maj.) Edward R. Garton, Artillery Armory, Vineland, N. J.
1st Lt. (Capt.) Harold I. Fiedler, 187 Hudson Ave., Red Bank, N. J.
Capt. (Lt. Col.) Harry L. Kinne, 155 Reservoir Drive, Boonton, N. J.
1st Lt. (Maj.) Mario J. Zecca, 223 Ridge St., Newark, N. J.
1st Lt. (Capt.) Harry McNamara, Jr., 5 S. Lincoln Ave., Wenonah, N. J.
1st Lt. (Lt. Col.) Curry N. Vaughan, N. M. Mil. Inst., Rosewell, N. M.
Capt. (Capt.) John M. Sullivan, 83-06 125th St., Richmond 18, N. Y.
Capt. (Lt. Col.) Wallace J. Nichols, 66 Winthrop Ave., Albany, N. Y.
Capt. (Lt. Col.) Carlos F. Reynolds, 139 Jefferson Ave., Rochester, N. Y.
1st Lt. (Capt.) Theodore J. Witt, 6324 Alderton St., Rego Park, Queens, N. Y.
1st Lt. (Maj.) Owen E. Woodruff, Jr., 192 Lisbon Ave., Buffalo, N. Y.
Capt. (Col.) Frank J. Oulley, 68 1st St., Yonkers, N. Y.
2d Lt. (1st Lt.) Gustav J. Braun, 313 Hollywood Ave., Brighton Station, Rochester, N. Y.
2d Lt. (1st Lt.) Lawrence J. White, 2500 University Ave., New York 63, N. Y.
2d Lt. (2d Lt.) William T. Van Atten, 1021 Park Ave., New York, N. Y.
1st Lt. (Capt.) William D. Meara, 115 Innis Ave., Poughkeepsie, N. Y.
2d Lt. (1st Lt.) Thomas A. Cook, 2428 Mecklenburg Ave., Charlotte, N. C.
Capt. (Lt. Col.) LeRoy B. Woodbury, Jr., 1107 Chestnut St., Wilmington, N. C.
1st Lt. (1st Lt.) Robert L. Westbrook, 108 Patrick St., Goldsboro, N. C.
1st Lt. (Capt.) Frank N. Ritter, 1936 Delaware Ave., Norwood, O.
1st Lt. (Capt.) Eldon R. Davis, 407 Fairview Ave., Galion, O.
1st Lt. (Capt.) Harry G. Hill, 419 N. E St., Yale, Okla.
1st Lt. (Maj.) James L. Allen, Ramona, Okla.
1st Lt. (Capt.) Paul R. Williams, 1500 16th St., N.W., Oklahoma City, Okla.
2d Lt. (Capt.) Judson F. Miller, 2165 East 38th St., Tulsa, Okla.
Maj. (Col.) Robert C. Lutz, 1205 North 16th St., Harrisburg, Pa.
1st Lt. (Maj.) G. A. Fraser, Jr., 6810 Clover Lane, Stonehurst Hills, Upper Darby, Pa.
1st Lt. (Maj.) Lewis C. Taynton, Box 507, Matamoras (Pike County), Pa.
1st Lt. (Capt.) John Zakel, Jr., R.F.D. 3, New Castle, Pa.
Capt. (Lt. Col.) Jacob R. Degenhardt, 2016 Brownsville Road, Pittsburgh, Pa.
1st Lt. (Maj.) John R. Whittick, 236 Roberta Ave., Collingdale, Pa.
1st Lt. (Capt.) Lamar M. Prosser, Kingstree, S. C.
1st Lt. (Capt.) George H. Simpson, 404 E. Main St., Rock Hill, S. C.
Maj. (Lt. Col.) Stephen W. Benkosky, 1895 Clemson Road, Columbia, S. C.
2d Lt. (2d Lt.) Warren A. Giles, 1020 N. Summit Ave., Sioux Falls, S. D.
1st Lt. (Maj.) Luther S. Crawford, Route 2, Hixson, Tenn.
1st Lt. (Maj.) James W. Cocke, 42 Middleton, Nashville, Tenn.
Capt. (Col.) W. M. Slayden, II, Waverly, Tenn.
1st Lt. (Col.) Jeff F. Hollis, 4306 Cambridge St., El Paso, Tex.
1st Lt. (Lt. Col.) J. F. Hollingsworth, Woodlawn Ranch, Sanger, Tex.
1st Lt. (1st Lt.) Maurice W. Howell, 251 Cotton Exchange Bldg., Lubbock, Tex.
1st Lt. (Maj.) Norvell R. Stark, 5105 Vanderbilt, Dallas, Tex.
1st Lt. (Maj.) Milton T. Hunt, Jr., Box 398, Brackettville, Tex.
1st Lt. (Maj.) Merle L. Goodrich, 116 Hot Wells Blvd., San Antonio, Tex.
Capt. (Col.) William E. Lobit, 1620 Avenue G, Galveston, Tex.
1st Lt. (Capt.) James H. Lee, 4815 Philip St., Dallas, Tex.
2d Lt. (Capt.) John T. Pierce, III, 3415 Guadalupe St., Austin, Tex.
1st Lt. (Maj.) Andrew R. Cheek, Box 67, Stockdale, Tex.
1st Lt. (1st Lt.) William M. Jones, 303 Ridgemont St., San Antonio, Tex.
Capt. (Lt. Col.) William E. Eckles, College Station, Tex.
1st Lt. (Maj.) Ted F. Douthitt, 3710 Huego St., El Paso, Tex.
1st Lt. (Lt. Col.) Thomas Dooley, 1103 W. Lamar St., McKinney, Tex.
1st Lt. (Maj.) Jack W. Fickessen, 2912 Marrow Ave., Waco, Tex.
1st Lt. (Maj.) Charles T. Krampitz, 822 Booty St., Corpus Christi, Tex.
2d Lt. (1st Lt.) William G. Weaver, Jr., 240 Bushnell Ave, San Antonio, Tex.
1st Lt. (Capt.) William J Boehmer, Box 224, Daingerfield, Tex.
1st Lt. (Maj.) Albert H. Hislop, 64 Main, Ludlow, Vt.

1st Lt. (Capt.) George S. Andrew, Jr., Northfield, Vt.
1st Lt. (Col.) Emett R. White, Arch St., Pittsford, Vt.
Capt. (Col.) Alfred E. Stevens, 3207 First St., N., Arlington, Va.
2d Lt. (1st Lt.) Edward J. Stenger, 3221 Ellwood Ave., Richmond, Va.
1st Lt. (Lt. Col.) George T. Pitts, Jr., 3676 Gunston Rd., Alexandria, Va.
1st Lt. (Lt. Col.) Michael Popowski, Jr., 3514 S. Wakefield St., Arlington, Va.
Capt. (Maj.) John L. Peyton, Steephill, Staunton, Va.
Maj. (B. G.) Glen C. McBride, 4827 North 16th Rd., Arlington, Va.
1st Lt. (Capt.) Norvell M. Walker, 7th and Court Sts., Lynchburg, Va.
2d Lt. (1st Lt.) Erwin R. Brigham, 604 Pollard Park, Williamsburg, Va.
Maj. (Col.) Glenn McBridge, 3425 Martha Custis Dr., Park Fairfax, Va.
2d Lt. (1st Lt.) Arnold V. Anderson, 5005 Phinney Ave., Seattle, Wash.
1st Lt. (Maj.) Brooks O. Norman, 2518 31st Ave., South, Seattle, Wash.
1st Lt. (Capt.) Robert J. Bird, 1385 33d Ave., South, Seattle, Wash.
Capt. (Maj.) Norman W. Parsons, 8 Forbes St., Elm Grove, Wheeling W. Va.
Capt. (Lt. Col.) Raymond B. Steiner, 2018 W. Walnut St., Milwaukee, Wis.
1st Lt. (Capt.) Arthur A. Olson, 913 22d St., Superior, Wis.
1st Lt. (Maj.) Matt W. Werve, 6119 11th Ave., Kenosha, Wis.

The table shows the breakdown by ranks and branches of the Regular Army appointees.

	MAJ.	CAPT.	1ST LT.	2D LT.	MAJ.	CAPT.	1ST LT.	2D LT.	TOTAL
					Detailed to Corps of Military Police				
Infantry	54	263	1,123	144	14	32	71	3	1,704
Air Corps	77	353	3,150	553					4,133
Field Artillery	53	152	534	70					809
Coast Artillery Corps	25	107	301	30					463
					Detailed to Transportation Corps				
Quartermaster Corps	20	120	160	7	31	117	190	30	675
Medical Corps	62	111	20						193
Dental Corps	43	83	2						128
Veterinarian Corps	8	72	4						84
Adjutant General Depart.	11	47							58
Pharmacist Corps	46	168	229	50					493
Chemical Warfare Service	5	18	52	4					79
Corps of Engineers	13	31	33	1					78
Ordnance Department	22	88	156	16					282
Signal Corps	15	66	101	13					195
Cavalry	9	40	105	20					174
Chaplain	50	62							112
						Detailed to AGD			
Finance Department	10	26	34	2			50		122
Judge Adjutant General	13	36							49
									Grand Total
Totals	536	1,843	6,004	910	45	149	311	33	9,831

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Activation of Organized Reserve Begins This Summer

ANOTHER step in the organization of the postwar Army of the United States will be taken this summer when activation of units of the Organized Reserve Corps will begin. The Organized Reserve Corps will continue to provide the units and personnel required to supplement the Regular Army and the National Guard in the event of an emergency.

Present War Department planning contemplates that reserve units will be organized under three classes:

1. "War-strength" units with a full complement of officers and enlisted men, supplied with essential equipment required for training and initial mobilization.
2. Units with a full complement of officers and a cadre of key enlisted personnel and essential training equipment.
3. Units with an assigned complement of officers only.

Initial activation will normally be in the third class, with progressive development through the second, into the first class. The final program calls for a large number of units under each of the above categories.

The fully organized units in the first class will form that portion of the Army of the United States designed to provide a balanced force when considered in conjunction with the Regular Army and the National Guard. These will be formed largely as "affiliated" units, and will be sponsored by business enterprises and organizations, and those civic organizations whose normal activities are closely allied with a military requirement. Examples of units in this group are Ordnance Motor Vehicles Assembly Companies, Heavy and Medium Maintenance Companies, Tire Repair Companies, Signal Operations and Construction Battalions, Quartermaster Depot and Sales Companies, Hospital Units, and Engineer Service and Construction units.

Although the exact number and types of units cannot be tabulated until the postwar program has been finalized and approved, Ground Forces units will include airborne, armored, and infantry divisions, and supporting units. Reserve units of the Air Forces will also be of all types, both combat and service.

Standards of training will vary, according to the classification of the unit. The war-strength units in the first class will be trained and equipped to take the field and function successfully in their assigned mission in the event of an emergency. Each of these units will have both active duty and inactive home training each year. Those of the second and third category will be given similar training to the extent required by their mobilization priorities.

Initial activation of units this summer will be based on the density of male population of military age, coupled with proper geographical distribution with the recently established Organized Reserve Military Areas, availability of personnel for units requiring technically trained personnel, and the availability of similar types of units of the Regular Army and National Guard in connection with active peacetime training facilities.

Initial activation of units this summer will be accomplished as follows: in each of the recently established Reserve Military Areas, the records of available reserve officer and enlisted personnel will be reviewed, and assignment of officers and enlisted personnel to individual units will be made, and the units activated.

The commanding generals of the Service Commands within the United States will be responsible for the administration of all personnel of the army within their respective areas.

In addition to personnel assigned to organized reserve units, there will be a requirement for a large number of officers and enlisted men as a reservoir to constitute the strength needed for expansion of the army in the event of mobilization and as replacements for all components. Such personnel will be trained as individuals or in some cases as composite units.

More than 225,000 officers of World War II have already accepted commissions in the Organized Reserve Corps. Procurement will be continued from ex-officers of World War II, graduates of accredited Senior ROTC units, graduates of officer candidate and aviation cadet training schools, flight officers who served creditably during the war, and specialists, including doctors, ministers, lawyers, and such technical experts as may be required.

Approximately 300,000 men have already enlisted in the Enlisted Reserve Corps, which is part of the Organized Reserve Corps, and it is expected that this figure will be materially increased before demobilization is complete. All enlisted personnel of the armed forces during World War II are eligible for ERC and army personnel may retain their present grade and ratings if they enlist within six months from separation date.

Promotion of officers under the present plan will be based upon length of service in grade, efficiency, and demonstrated command or staff ability at the appropriate level. Promotions for enlisted men will be based on the regulations prescribed for the Regular Army.

The Organized Reserve program is completely voluntary.

Service Medals and Decorations*

THIS is background information to help you recognize the War Department's decorations and medals, and to give you a brief history of each of them. You'll probably want to retain this list for future reference. They are listed in the order of their precedence (the Oak Leaf Cluster being issued in lieu of an additional medal with the precedence of the medal it represents). Also included are the various service medals awarded to Military personnel who have taken part in the campaign or during the emergency period the medals represent. These are earned by honorable service only. Here is the list:

DECORATIONS FOR VALOR AND ACHIEVEMENT

Medal of Honor

This, the highest and most rarely awarded decoration conferred by the United States, was established by Act of Congress in 1862. It is awarded in the name of Congress to an officer or enlisted man of the Army, who, in actual conflict with an enemy, distinguishes himself conspicuously by gallantry and intrepidity at the risk of his life and above and beyond the call of duty.

The Medal of Honor is a five-pointed star, surrounded by a laurel wreath, suspended from a bronze bar bearing the inscription, "For Valor," and surmounted by an eagle. In the center of the star is a head of Minerva, encircled by the inscription, "United States of America." On the reverse of the medal are engraved the grade, name, and organization of the recipient, with the place and date of the act for which the award was granted. The ribbon is light blue, with thirteen white stars.

Distinguished Service Cross

Instituted by Congress in 1918, the Distinguished Service Cross is awarded to persons who, while serving in any capacity with the Army of the United States, distinguished themselves by extraordinary heroism in connection with military operations against an armed enemy.

It is a cross of bronze with an eagle on the center. Below the eagle, is a scroll bearing the inscription "For Valor." On the reverse the name of the recipient is engraved within a wreath. Its ribbon is a broad band of blue, bordered on both edges by narrow bands of red and white.

Distinguished Service Medal

Dating also from 1918, this decoration is awarded to persons who, while serving in any capacity with the Army of the United States, distinguished themselves by exceptionally meritorious service to the Government in a duty of great responsibility, and to all enlisted men of the Army to whom the certificate of merit had, on or before July 9, 1918, been granted under the provisions of previously existing law.

The coat of arms of the United States in bronze surrounded by a circle of dark blue enamel bears the inscription "For Distinguished Service" and the year of award. On the reverse is engraved the recipient's name upon a scroll on a trophy of flags and weapons. The ribbon is composed of bands of scarlet, a stripe of dark blue, a band of white, a stripe of dark blue, and a band of scarlet.

The Legion of Merit

The award of the Legion of Merit will be made to outstanding officers and enlisted men of the armed forces of the United States or of friendly foreign nations who shall have distinguished themselves by exceptionally meritorious conduct in the performance of outstanding services.

This decoration, like the Purple Heart, stems from the Badge for Military Merit, America's oldest decoration, established by George Washington in 1782. As was the case with the Badge for Military Merit, it will be awarded for "extraordinary fidelity and essential service." It will constitute a reward for service in a position of responsibility, honorably and well performed.

The design of the Legion of Merit has been developed from the Great Seal of the United States, also approved by Congress in 1782.

The obverse or front of the Badge of the Legion of Merit is a five-pointed American star, of heraldic form, in red and white enamel, centered with a constellation of the 13 original stars on a blue enameled field breaking through a circle of clouds. The star is backed by a laurel wreath, the symbolic award for achievement, which is interlaced with crossed war arrows in gold, pointing outward, representing the protection afforded by the armed forces to the Nation.

On the reverse are the words, "United States of America," inscribed on a circling ribbon. In the center is space left for inscription of the name and rank of the individual to whom the award is made. Surrounding this is a band which carries the words (taken from the reverse of the Great Seal) "Annuit Coeptis" (He (God) has favored our undertakings), and the date MDCCLXXXII, the year of the founding of the decoration. The ribbon is of purple-red color, edged with white.

Silver Star

The Silver Star was not instituted until 1935, but like the Distinguished Service Cross and Distinguished Service Medal is retroactively awarded. It is granted to persons serving in any capacity with the Army cited for gallantry in action which does not warrant the award of a Medal of Honor or the Distinguished Service Cross.

The design is a silver star superimposed on a bronze star, the rays of the two coinciding. On the reverse is engraved the inscription "For gallantry in action" and the name of the recipient. On the ribbon are stripes of blue, white, blue, white, red, white, blue, white and blue.

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*The Reserve Officer.

Distinguished Flying Cross

The Distinguished Flying Cross is awarded to any person, who, while serving in any capacity with the Air Forces of the Army of the United States, subsequent to April 6, 1917, distinguished himself by heroism or extraordinary achievement while participating in an aerial flight. No person is eligible for this award for any act performed prior to November 11, 1918, except (1) Officers or enlisted men who have heretofore been recommended for but have not received the Congressional Medal of Honor, the Distinguished Service Cross or the Distinguished Service Medal; (2) Officers or enlisted men who displayed heroism while serving as instructors or students at flying schools.

On a bronze cross patee is a four-bladed propeller. On the reverse are engraved the grade, name, and organization of the recipient, with the date of award. The ribbon's stripes are blue, white, blue, white, red, white, blue, white and blue.

Soldier's Medal

Instituted in 1926, this decoration is awarded to military personnel of the Army of the United States and to members of the Navy, Marine Corps and foreign military personnel serving with the Army who have distinguished themselves by heroism not involving actual conflict with an enemy.

On a bronze octagon is displayed an eagle standing on a fasces between groups of stars and above a spray of leaves. A shield on the reverse is inscribed "U.S." and supported by sprays of laurel and oak leaves. The words, "Soldier's Medal," "For Valor," and the recipient's name appear as inscriptions. The ribbon is composed of two outside stripes of blue, with the center containing 13 white and red stripes of equal width.

Bronze Star Medal

The Bronze Star Medal was authorized February 4, 1944, by President Roosevelt. It was established for award to any person, who, while serving in any capacity in or with the Army, Navy, Marine Corps, or Coast Guard, on or after December 7, 1941, distinguished, or has distinguished, himself by heroic or meritorious achievement or service, not involving participation in aerial flight, in connection with military or naval operations against an enemy of the United States.

The medal consists of a bronze star, in the center thereof a smaller and raised bronze star, the center lines of all rays of both stars coinciding. On the reverse side of the medal is the inscription "Heroic or meritorious achievement" and a space for the name of the recipient. The star is suspended by a rectangular-shaped metal loop with corners rounded from a silk moire ribbon. The ribbon is of Old Glory Red with a one-eighth inch vertical stripe of Royal Blue in the center. The stripe is separated from the red by white piping and the ribbon is edged with white piping.

No more than one Bronze Star Medal may be awarded to an individual, but for each succeeding heroic or meritorious achievement or service justifying such an award, an Oak Leaf Cluster will be given in lieu of the medal. The award of the Bronze Star may be made posthumously to a designated representative of the deceased.

Air Medal

Authorized by Executive Order of the President in 1942, the Air Medal is awarded to any person who, while serving in any capacity with the Army of the United States subsequent to September 8, 1939, distinguishes himself by meritorious achievement while participating in an aerial flight. This decoration is awarded in those cases where the act of meritorious service does not warrant the award of the Distinguished Flying Cross.

Pendant from a ribbon striped with the Air Corps colors of blue and gold is a fleur-de-lis which surmounts a compass rose. In relief on the rose is a swooping American eagle with lightning bolts clutched in his talons.

Purple Heart

Although originally established by General George Washington in 1782, the Purple Heart was not issued for many years. It was reëstablished in 1932. While it was conferred for any singularly meritorious action or service performed in the World War, its award by field commanders is now restricted to its alternate occasion: a wound, which necessitates treatment by a medical officer, and which is received by Army personnel in action with an enemy of the United States. Also a posthumous award of the Purple Heart is made to the next of kin of officers or enlisted men killed in action or who die of wounds received in action.

On a purple enameled heart within a bronze border is a profile head in relief of General George Washington in military uniform; above is his coat of arms between two sprays of leaves in green enamel. On the reverse below a shield and leaves is a raised bronze heart with the inscription, "For Military Merit," and the name of the recipient. The ribbon is purple with white edges.

Good Conduct Medal

This medal is authorized for award to those enlisted men of the Army of the United States, in all its components, who on or after June 28, 1941, honorably completed one year of active Federal military service and who are recommended for the award by their commanding officers for exemplary behavior, efficiency, and fidelity.

Obverse: an eagle with wings displayed and inverted, standing on a sword which rests on a closed book; and encircling design is formed by the words, "Efficiency, Honor, Fidelity." Reverse: Within wreaths of laurel and oak, a five-pointed star above a scroll bearing the words, "For Good Conduct." Ribbon: scarlet, with three white stripes on each side.

Each subsequent additional three-year period (up to five), justifying the award of this medal, entitles the wearer to a bronze clasp in the form of a knot.

Other Decorations

The Fourragere was awarded to organizations of the Army of the United States cited by the French for distinction in the World War. It consists of a single cord, braided and knotted, of yellow and green threads for four citations and of dark green with scarlet threads for two citations, terminated at the shoulder end with a buttonhole and at the free end with a ferret of blue metal. Attached to it are distinctive marks identifying the organization which won it. It is won by officers and men on duty with that organization or, as an individual decoration, by former members of that command who were present on four or two occasions (for the respective types) when citations were made.

Gold wound and service chevrons, earned during the World War and worn on the right and left sleeves respectively, are not authorized for the present war but may continue to be worn during the present war. A gold bar, worn horizontally on the left sleeve, has been authorized to represent six months of overseas service in the present war.

BADGES

Badges are awarded in recognition of services rendered by Infantrymen and members of the Medical Department assigned or attached to the Infantry. There are three badges—the Combat Infantryman Badge, the Expert Infantryman Badge and the Medical Badge. Badges do not represent individual feats of valor or achievement but are awarded in recognition of exemplary proficiency in those tasks which are characteristic of the individual's branch of service.

The Combat Infantryman Badge

The Combat Infantryman Badge is won by satisfactory performance of duty in ground combat against the enemy. It consists of a miniature silver rifle mounted on an infantry blue field with silver border, three inches long and one-half inch wide, with a silver wreath extending across the bottom and up the sides of the badge.

The Expert Infantryman Badge

The Expert Infantryman Badge is won by attaining the standards of proficiency established by the War Department. It is a replica of the Combat Infantryman Badge minus the wreath.

The Medical Badge

The Medical Badge is awarded in recognition of the important rôle being performed by medical personnel on duty with infantry units. It is intended that this badge shall be awarded only to those who are daily sharing with the infantry the hazards and hardships of combat. The badge is of silver metal, elliptical in shape with the Medical Department's insigne the caduceus and the Geneva Cross superimposed on a litter surrounded by a wreath of oak leaves.

SERVICE MEDALS

Designs symbolize the country in which the campaign or service took place or the enemy against whom the war was waged. Similar colors of the enemy nation may appear in the ribbon.

Civil War Campaign Medal

Obverse: head of Lincoln, surrounded by the words, "With malice toward none; with charity for all." Reverse: the words, "Civil War," with the dates, 1861-1865, within a wreath of oak and olive branches. Ribbon: two bands of blue and gray.

Indian Campaign Medal

Obverse: a mounted Indian; above the words, "Indian Wars," and below a buffalo skull and arrowheads. Reverse: a trophy composed of an eagle perched on a cannon supported by crossed flags, rifles, an Indian shield, and a quiver of arrows, spear, a Cuban machete, and a Sulu kris. Ribbon: alternate bands of red and black.

Spanish Campaign Medal

Obverse: a two-towered castle within a circle composed of the words, "War with Spain"; the date, 1898, a branch of tobacco plant and a stalk of sugar cane. Reverse: same as that of the Indian Campaign Medal. Ribbon: two bands of blue, separated by one of yellow, with a border of yellow on each edge.

Spanish War Service Medal

Obverse: sheathed Roman sword on a tablet inscribed, "For Service in the Spanish War." Reverse: coat of arms of the United States, surrounded by a wreath displaying the insignia of the Infantry, Artillery and Cavalry. Ribbon: green with a band of yellow 1/8 inch from each edge.

Army of Cuban Occupation Medal

Obverse: coat of arms of the Cuban Republic, with wreath and fasces, surrounded by the words, "Army of Occupation, Military Government of Cuba"; above the shield the dates, 1898 and 1902. Reverse: same as Indian Campaign Medal. Ribbon: band of red, yellow stripe, band of blue, yellow stripe, band of red, with a border of blue on each edge.

Army of Puerto Rican Occupation Medal

Obverse: two-towered castle and the words, "Army of Occupation, Puerto Rico"; branch of tobacco plant and stalk of sugar cane. Reverse: same as Indian Campaign Medal. Ribbon: band of blue, yellow stripe, band of red, yellow stripe, band of blue, with a border of red on each edge.

Philippine Campaign Medal

Obverse: cocoanut-palm tree; a lamp of knowledge and the scales of justice; the whole surrounded by a circle composed of the words, "Philippine Insurrection," and the date, 1899. Reverse: same as Indian Campaign Medal. Ribbon: broad band of blue between bands of red, with a narrow strip of blue on each edge.

Philippine Congressional Medal

Obverse: Color-bearer with the United States flag and a color guard; on the rim the words "Philippine" and "Insurrection" and below the date, 1899. Reverse: the words, "For patriotism, fortitude, and loyalty," in a wreath of pine and palm. Ribbon: band of blue, with a stripe of white separating it from bands of red, white and blue.

China Campaign Medal

Obverse: the Imperial Chinese five-toed dragon within a circle composed of the words, "China Relief Expedition," with the dates 1900-1901. Reverse: same as Indian Campaign Medal. Ribbon: band of yellow with edges of blue.

Army of Cuban Pacification

Obverse: coat of arms of the Cuban Republic with wreath and fasces, supported by two American soldiers with rifles at parade rest; the words, "Cuban Pacification," and the dates, 1906-1909. Reverse: same as that of Indian Campaign Medal. Ribbon: band of olive drab with a blue stripe separating it from bands of white and red on each edge.

Mexican Service Medal

Obverse: the Mexican yucca plant in flower, with mountains in the background; above the words, "Mexican Service," and the dates, 1911-1917. Reverse: same as Indian Campaign Medal. Ribbon: green stripe, band of yellow, and green stripe.

Mexican Border Service Medal

Obverse: a sheathed Roman sword on a tablet inscribed "For service on the Mexican border." The tablet is surrounded by a wreath. Reverse: same as that of Spanish War Service Medal. Ribbon: green with a yellow band in the center.

Victory Medal

Obverse: a winged Victory. Reverse: the inscription, "The Great War for Civilization," and the coat of arms of the United States surmounted by a fasces, and on either side the names of the allied and associated nations. Ribbon: colors representing two rainbows placed in juxtaposition.

The nineteen clasps authorized to be worn on the ribbon of this medal according to the service of the recipient are: Cambrai, Somme Defensive, Lys, Aisne, Montdidier-Noyon, Champagne-Marne, Aisne-Marne, Somme Offensive, Oise-Aisne, Ypres-Veneto, Defensive Sector, France, Italy, Siberia, Russia, England.

Army of Occupation of Germany Medal

Obverse: profile of General John J. Pershing in uniform of the World War, above four 5-pointed stars; the General's name inscribed on the dexter side, and on the sinister an unsheathed sword, point up; within a laurel wreath the years, 1918 and 1923. Reverse: an eagle with wings spread perched on Castle Erhenbreitstein within a circle composed of the words, "U. S. Army of Occupation of German" and three 5-pointed stars. Ribbon: stripes of blue, red, white, black, white, red, and blue.

American Defense Service Medal

Issued to military personnel on active Federal service of 12 months or longer and who in discharge of such service served at any time between September 8, 1939, and December 7, 1941, Ribbon: yellow with narrow red, white and blue stripes near the edges.

American Theater Campaign Medal

For one year or more service in the United States between December 7, 1941, and September 2, 1945. Also for service less than one year, but more than 30 days, outside of the continental United States and in the American Theater, which included all areas outside the European and Asiatic-Pacific Theaters. Ribbon: blue with narrow red, white and blue stripes in the center, representing the colors of the United States; a combination of narrow black and white stripes, representing the colors of Germany; and narrow red and white stripes representing Japan, near each end.

European-African-Middle Eastern Campaign Medal

For service in the theaters indicated. Ribbon: green for the green fields of Europe, with narrow stripes of United States colors in the center flanked by narrow stripes of the Italian colors of green, white and red near the left end, and by narrow stripes of the German colors near the right end; edges are brown for the sands of the desert.

Asiatic-Pacific Campaign Medal

For service in the theaters indicated. Ribbon: orange, with narrow stripes of United States colors in the center, flanked by narrow stripes of the Japanese colors near each end.

The Medal for Merit for Civilians

The Medal for Merit is the counterpart of the Legion of Merit, for award to civilians.

World War II Occupation Ribbon

For service in Germany, Austria or portions of Italy subsequent to May 8, 1945, and in Japan and Korea after September 2, 1945. Appropriate clasps marked "Germany" and "Japan" have been authorized to be attached to the ribbon of the medal to denote service in Europe and the Far East. Service performed between September 3, 1945, and March 2, 1946, both dates inclusive, with the Army of Occupation of Japan and (or) Korea will be counted only if the Asiatic-Pacific Campaign Medal has been awarded for service prior to September 3, 1945. Ribbon: white, 3/16-inch wide; black, ½-inch wide; red, ½-inch wide; and white, 3/16-inch wide. The service ribbon will be worn immediately after the World War II Victory Medal service ribbon.

The Proper Wearing of Service Ribbons

by Major Hal D. Steward★

HIDDEN deep in the masses of Army Regulations, War Department Circulars, changes to regulations, etc., are the rules governing the correct wearing of Service Ribbons. Because of inaccessible information, many members of the military service today are seen wearing service ribbons improperly.

A total of 1,725,344 Army decorations and awards were made to Army personnel from December 7, 1941, through November 30, 1945, the War Department has announced. In addition to this, millions of Theater ribbons were also awarded.

Taking for granted that each member of the service knows exactly what ribbons he is entitled to wear then the problem of assembling them and placing them in the correct position on the uniform presents itself.

Ribbons for decorations and service have an established precedence with the Congressional Medal of Honor ranking the highest. They are placed on the uniform according to the following precedence long set by the War Department:

1. Medal of Honor; 2. Distinguished Service Cross; 3. Distinguished Service Medal; 4. Silver Star; 5. Legion of Merit; 6. Distinguished Flying Cross; 7. Soldier's Medal; 8. Bronze Star Medal; 9. Air Medal; 10. Commendation Ribbon; 11. Purple Heart; 12. Medal for Merit (civilian award); and 13. Good Conduct Medal.

Service ribbons awarded for service in Theaters of Operations are placed in the proper position according to the date they were awarded. In other words, the service ribbon awarded you first ranks the highest in position on the uniform.

In placing the ribbons on the uniform the most junior ribbon is placed on the bottom row and to the wearer's left. The senior ranking ribbon is placed on the top row and to the wearer's right. Seniority of colors is also involved in placing ribbons in the proper place. Blue, the senior color, is always worn to the right.

Foreign decorations and service ribbons rank below all American ribbons and therefore must always be placed on the bottom row and to the left.

The normal number of ribbons in a row is three. If there are too many rows, four may be placed in each row. The shortest row is always on top and centered. Ribbons are centered above the left breast pocket with one-eighth of an inch between the pocket-flap seam and the first row. If more than one row is worn there should be a space of one-eighth of an inch between each row. Badges are worn on the left breast above the line of service ribbons.

Let us, for an example, suppose a serviceman is entitled to the Silver Star, Bronze Star Medal, Purple Heart, Good Conduct Medal, Asiatic-Pacific Theater Ribbon, American Theater Ribbon, Victory Ribbon and Philippines Liberation Ribbon. They would be ranked on the uniform in the order just mentioned. The Silver Star and Bronze Star would be on the top row, centered, with the Silver Star on the wearer's right. The second row would be from right to left: Purple Heart, Good Conduct Medal and Asiatic-Pacific Theater Ribbon. The third and bottom row from right to left would be: American Theater Ribbon, Victory Ribbon and the Philippines Liberation Ribbon, which is a foreign award.

Battle stars are placed on the service ribbons with the points down. The arrowhead, which is given for an assault landing, is worn on the ribbon with the arrow point up.

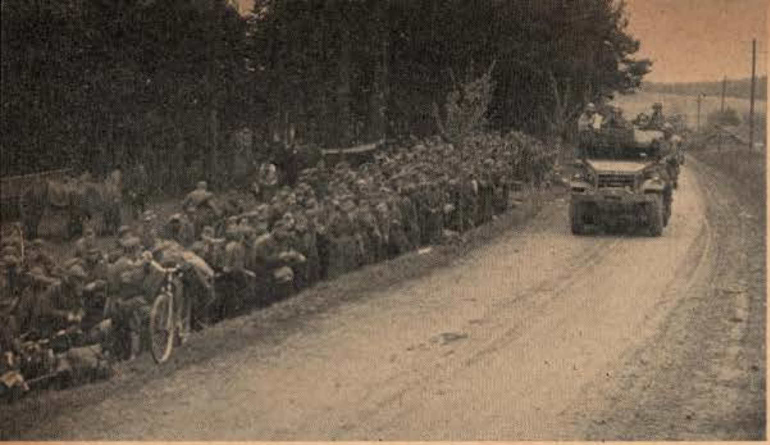
One point of interest to Enlisted Men who have joined the Regular Army after serving on active duty during World War II as a commissioned officer is the change in Army Regulations allowing former officers of the recent war as well as World War I to wear a band of forest green braid around both sleeves of the service coat and short overcoat. This green braid will be one-half an inch wide and the lower edge of the braid will be three inches from the end of the sleeve.

When a new ribbon is awarded, a rearrangement of all the ribbons senior to this new award must be made so that it will be in its proper place.

"Decorations are awarded in recognition of and as a reward for extraordinary, unusual, or outstanding acts or services and are cherished accordingly by the recipients," according to Army Regulations 600-45, dated September 22, 1943. This regulation with its current changes will keep you posted on the award of ribbons and their precedence.

The Congressional Medal of Honor and Purple Heart are not awarded to personnel of foreign nations. The Distinguished Service Cross and Legion of Merit can be awarded to foreigners only after the approval of the President. The Medal of Honor, Distinguished Flying Cross and Soldier's Medal cannot be awarded to civilians.

★Press Branch, War Department, Bureau of Public Relations.



Vehicles of the 13th Armored Division, Third U. S. Army, pass along road to Braunau, Germany, while hundreds of captured Germans wait by the roadside.

THE 16TH ARMORED DIVISION

Since no action pictures of the 16th Armored Division were available—probably because it reached the ETO in time to be in combat only one day—a brief history of the Division is given here. This concludes a series of photos and brief histories of all armored divisions which has been published in The Cavalry Journal.

The 16th Armored Division was activated in July, 1943, at Camp Chaffee, Arkansas, where it remained throughout its training.

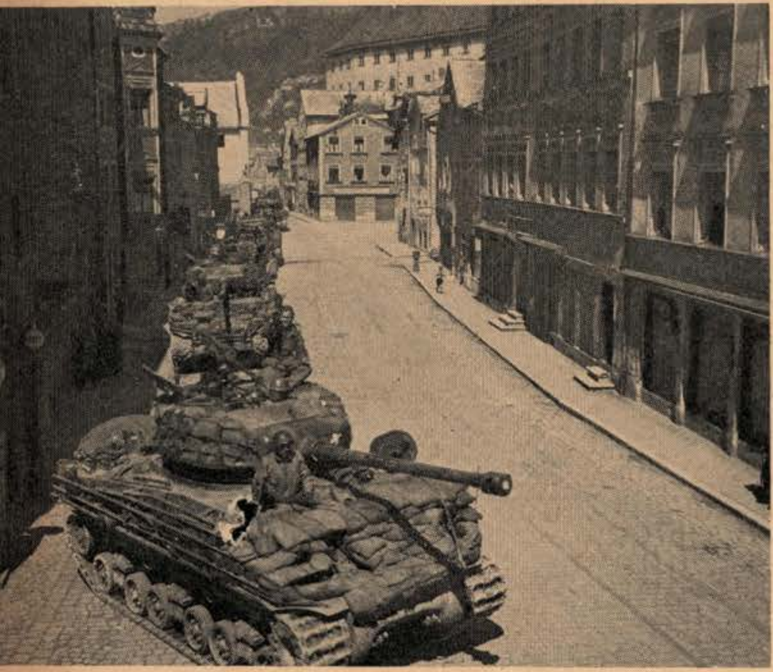
It left the United States in January, 1945, for the European Theater of Operations, its components at the time consisting of the 395th, 396th and 397th Armored Field Artillery Battalions; 5th, 16th and 26th Tank Battalions; 18th, 64th and 69th Armored Infantry Battalions.

Arriving in France on February 5, 1945, and assigned to the Third Army, the Division entered combat on May 6 when it launched its assault on the city of Pilsen, furthest point of American penetration into Czechoslovakia. The city was taken during the Division's one day of combat, during which it rounded up 8,000 prisoners and many civilians fleeing the Russians. It subsequently was stationed at Pilsen.

ARMORED DIVISIONS IN WORLD WAR II

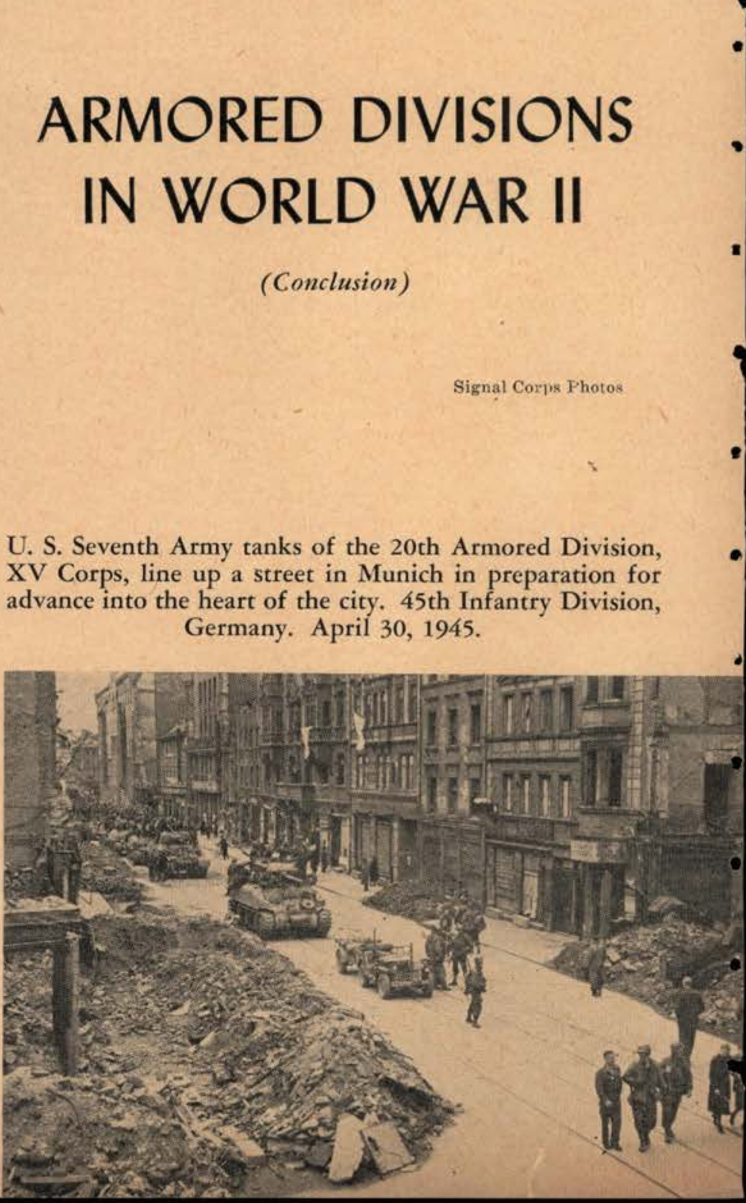
(Conclusion)

Signal Corps Photos



Tanks of the 14th Armored Division roll into newly captured Eichstatt, Germany, with other U. S. Third Army elements. April 25, 1945.

U. S. Seventh Army tanks of the 20th Armored Division, XV Corps, line up a street in Munich in preparation for advance into the heart of the city. 45th Infantry Division, Germany. April 30, 1945.



Book Reviews

THE CONQUEST OF THE MISSOURI. By Joseph Mills Hanson. Murray Hill Books, Inc. $3.50.

This is one of the classic narratives of the American West, first published in 1909. This re-issue will undoubtedly meet a welcome audience of both old friends and new. Joseph Mills Hanson tells the story of the opening of the Northwest conveying to the reader the prevailing spirit of zest and enterprise. The story is told through the reminiscences of Captain Grant Marsh, one of the greatest river pilots ever to navigate the Missouri—reminiscences of the years when the Northwest was being transformed from a lonesome wilderness inhabited by elk, buffalo, and hostile Indians, and small isolated forts and settlements to the mining and agricultural region of our time.

Through Captain Marsh, one learns of the surveying of the upper reaches of the Missouri, the Big Horn and Little Big Horn rivers, and the Yellowstone Valley, of the disastrous campaign of Custer's Seventh Cavalry, of the campaigns of General Terry and General Miles against the Indians, and of such things as the coming of the railroads and river boat races.

You will enjoy this complete account of the Missouri region from 1864 to 1883 if you read it for the first time, and welcome it as an old friend if you have read it before.

* * *

AMERICANS: A BOOK OF LIVES. By Hermann Hagedorn. John Day. $5.00.

Here is a volume of short biographical sketches of seventeen great Americans, Mark Twain, Oliver Wendell Holmes, Thomas A. Edison, Luther Burbank, Booker T. Washington, Theodore Roosevelt, Woodrow Wilson, Jane Addams, John Dewey, Louis D. Brandeis, George Washington Carver, Henry Ford, Helen Keller, Will Rogers, Herbert Hoover, Franklin Roosevelt, and Wendell Willkie. They are linked together to form an almost continuous story of great lives lived in the United States during the twentieth century. These seventeen lives are interwoven into a personalized history of the nation during the full century in which they lived. Beginning with the opening of the West (the life of Mark Twain), it takes the reader through the Civil War (the life of Holmes), and the industrial era (Carver, Edison, and Ford), and through World War II (with Franklin Roosevelt and Wendell Willkie).

These stories of great lives lived in the United States during the twentieth century were originally intended for publication abroad, as a step toward international understanding, but are now offered also to readers within the United States. These National sagas, familiar and dear to the heart of Americans will make a welcome addition to any library. The book can be read and enjoyed, just as one enjoys old friends.

ALL DOGS GO TO HEAVEN. By Beth Brown. Frederick Fell and Company. $2.50.

Have you ever heard the question spoken from young, inquisitive lips, "Mommy, will Rags go to heaven when he dies"; or perhaps had the self-same question occur to you? The ever-faithful, loving dog who is a true friend no matter what, the playful little puppy who drags away shoes and is generally a lovable nuisance—what happens to their personalities when death suddenly strikes? If you've lost a beloved dog, if you've longed for a pet you've never had, if you enjoy your own special dog's friendship from day to day, then you'll welcome this story by Beth Brown. It is the story of twelve little dogs in particular and all dogs in general. They live for you in a pet cemetery and speak to say that there is no death. There is only life in another form. You have not lost your dog; they are never lost.

This is the story of Hobo, who is welcomed to "Dog Heaven" by Old Buck, the patriarch; of little Rowdy, who left his earthly life when yet a pup; of Tramp, who still likes to drink beer with his master; and of frivolous, young Gwendolyn, the vamp. Hobo learns to overcome his sorrow at leaving his mistress and, in a loving dog-like manner, to soften his grief. He in turn welcomes others to the cemetery, among them Champ, the movie dog, and Young Buck, who lost his life in the war. Each dog lives for you in the pages of the book, and, though you may never have had a dog you'll find a warm spot in your heart for some canine—perhaps just a stray mutt you pass on the street.

This is a book for young and old. You will want to read and own it; above all, you will want your children, from youngest to oldest, to know its story. It is an ideal gift to a youngster for birthday or Christmas.

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LAST CHAPTER. By Ernie Pyle. Henry Holt and Company. $2.50.

Ernie Pyle, the most popular and widely read of war correspondents, pioneered in war reporting and, in bringing the war home to the people, made it real to millions for whom it had been too vast to comprehend. He accomplished this by his contact with the GI, by asking him how war felt, by living with him and sharing his experiences. *Here Is Your War* sold 1,320,000 copies, *Brave Men* 1,300,000 copies. When the European war was over, Pyle did not rest on his laurels, as well he might, but set off for the Pacific war, and here wrote his final book of war reporting. At best it is only a fragment—written as he went along while his memories were fresh—cut short by a Japanese bullet in the first part of the Okinawa campaign.

In *Last Chapter,* as in his other books, Ernie Pyle writes of the war with all honesty and no pretensions, seeing and telling the little things about war—the unheroic as well as the heroic, and thus making war become real. He reports the fight the way he saw it; he relates personal incidents; he names names and gives addresses; and, through it all, his facts have a sort of compassionate and wistful truth.

Of this brief, brave book—to which an Associated Press Correspondent wrote the last lines, "April 18—Ernie Pyle . . . was killed by a Japanese bullet through his left temple this morning."—and its author, the *New York Times* says, "Many of Ernie's stories were gotten at the risk of never living to write them. The whole Army, to him, was a sort of Lost Battalion which he rescued from the No-Man's-Land of the communiqué to bring as close to home as the written word can do. And it is not unfitting that out of all this Army he should have stayed with those who will not come back. He did not choose this—no soldier ever does. In his own words: 'They died and others lived and nobody knows why it is so. They died and thereby the rest of us can go on and on.' "

* * *

WRATH IN BURMA. By Fred Eldridge. Doubleday & Company, Inc. $3.00.

Among the unique personalities of World War II stands "Vinegar Joe" Stilwell—the General who was the central and dominating figure of the war in the Far East, the friend of the GI who marched with his men and led them over insurmountable difficulties, the determined and angry man who, after retreat from Burma, was not afraid to say, "We got the hell licked out of us." With this personality Fred Eldridge has embued *Wrath In Burma.* The book gives the reader the feeling that he was there, sharing with General Stilwell the trials and difficulties of this campaign. "Vinegar Joe" was never a brass hat, and this story is alive with anecdotes from his everyday life. Its pages are brightened by such characters as Braud, who drove the "Gen'l's" jeep, Buttercup, Stilwell's Chinese orderly, and Sergeant Jules (Gus) Reynault, his cook. It is full of incidents that tell why the men of the CBI were deep in sadness and gloom on receiving word of Stilwell's recall.

Though built around General Stilwell, the book is a political history of Asia as well. It is not a soft book; it faces the uncensored facts in an attempt to bring clarity and coherence to the controversy that raged over the management of affairs in the Far East. It is a story about how the United Nations should not get along. The writer endeavors to show the reader and the United Nations that in order to gain harmony, first and foremost, agreements must be kept. He tells frankly how the British and Chinese impeded harmony in the Far East by failing to keep agreements—facts that were not generally known in America before the end of the war.

This is another well-written phase of World War II—one that contributes greatly to the complete picture, but aside from that it is a story you will want to read for pure enjoyment.

* * *

TRAIL DUST AND SADDLE LEATHER. By Jo Mora. Charles Scribner's Sons. $3.00.

Jo Mora was born in Uruguay in 1876 but came to the United States when a child. He was educated in Massachusetts and studied art in New York. After several years of work as a newspaper artist, he went to the west and southwest to study the Hopi and Navajo Indians, and there he stayed. *Trail Dust and Saddle Leather* is a book about the West, about the cowboy—his origin and his working tools—about western lore in general. Why did he write the book? This question is answered clearly in the preface.

"A great wave for 'riding Western on Western-broke horses with Western rigs' is sweeping the country. Today you'll find rodeos well patronized in the extreme East, and the fiesta silver-mounted stock saddle is no stranger in that fringe, where, but a few years ago, most folks there only knew that cowboys rode on a big, funny sort of cradle with a great, round, flat-topped doodad sticking up in front. Half of them did not know whether this was used as an emergency field writing desk or a permanent tray for their afternoon tea when exacting range duties kept these semiwild muchachos in the saddle.

"It was to clear up so many of these natural misconceptions, and to answer ever-increasing requests to describe in greater detail the various tools and accoutrements of the cowboy, with their genesis and evolution, that I was spurred on to write and illustrate this book."

This is a book about waddies, vaqueros, Buckaroos, Punchers, Cattlemen, Cowmen, Cowhands, Cowpokes, and Cowpunchers—how they work and how they live, and how their art has developed through the years. It is cleverly illustrated with drawings by the author, of the cowboy, himself, his techniques and his tools. You will read the book for enjoyment, but you may be sure that, when you have finished, you will know a lot about the West.

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THE ARMY WRITER. By David Klein. Military Service Publishing Company.

This is a book for anyone in the army who writes—every commissioned officer, every first sergeant, every clerk in every headquarters. It tells how to write correctly, easily, and so accurately that there is no danger of misinterpretation. Grammar is presented, not in the dusty, dry manner of textbooks, but as a means of making words mean to the reader what they mean to the writer. Mr. Klein offers a cure for the "mysterious malady of speech that attacks many an officer when he first chews his pencil in composing a military memorandum. . . . The victim of this disease can be readily recognized by his writings. He never 'begins' anything; he either 'initiates,' 'inaugurates,' or 'commences' it." In this brief and clearly written volume, the author shows the army writer how to avoid the stilted, long-winded military form and give himself "At Ease." For instance: *"The transfer of ordnance equipment may be accomplished by means of the execution of a shipping ticket by the property officer concerned,"* really means *"A property officer may transfer ordnance equipment by making out a shipping ticket."* He points out common faults which invite misinterpretation. *"In order to insure minimum injuries to crew members, bombs must be stacked neatly,"* and *"Hooks seldom break but usually fail by straightening under the load."* This book, well-indexed for easy reference, is a welcome deskside companion and one to be read for pleasure as well. An attractive feature is the last chapter, "In Business for Yourself," dealing with private writing. Even though writing may not be a part of your army routine this is a book for you. Whether you like to write, need to write, or have to write, *The Army Writer* will prove valuable.

* * *

COME OUT FIGHTING. By John Durant and Edward Rice. Duell, Sloan, and Pearce. $3.00.

Just as the title implies, this is a book about fighting. It is a pictorial history of the ring, containing over 200 prints and photographs, selected by Edward Rice, combined with text and captions by John Durant. Of interest, too, is the foreword by Quentin Reynolds. The authors give the history of pugilism from its beginnings with the Greeks to our time. They tell the stories of such great ring personalities as John L. Sullivan, Gentleman Jim Corbett, Ruby Bob Fitzsimmons, Dempsey, Tunney, and Joe Louis. They answer many questions, and among them, perhaps is an answer you've been wondering about.

As Quentin Reynolds says, "If you are one of us who sits tense just before the bell rings and for whom time stops when the referee, gray-clad and pale-faced under the piercing white lights, says "Come out fighting," you'll read this book with interest and excitement. And if you've never seen a fight before, nor read about one, nor looked at a fight picture, this is the book that will initiate you into the fraternity of fight fans."

EMPIRE AND THE SEA. By Fletcher Pratt. Henry Holt and Company. $3.50.

In this book Fletcher Pratt tells the story of British naval warfare from 1793 to 1805—twelve years which saw many engagements at sea, some large, others small. Beginning with the younger Mr. Pitt's request for war against the growing strength of the new French Republic, it tells of the "Glorious First of June," Aboukir, Copenhagen, Cape St. Vincent, and Trafalgar and the naval geniuses, Nelson, Jervis, Howe, and Hood. These were the men and battles that saved England from invasion, contributed to the downfall of Napoleon, and established Britain as ruler of the seas. An interesting picture of troubles with Ireland, mutinies in the channel fleet, difficulties over food and supplies, and political feuds is presented. A full and interesting account is given of the Battle of Trafalgar, which cost Lord Nelson his life but marked the beginning of the British Empire.

The author, well-known as a naval historian, has provided a clear and authentic account of war at sea.

* * *

THE AMERICAN. By Howard Fast. Duell, Sloan, & Pearce, Inc. $3.00.

This is the story of John Peter Altgeld of Illinois—the story of his rise from his lowly, uneducated beginnings on the farm of his immigrant parents to wealth and political power—the story of his sacrifice of money and position to champion democracy.

The Father of John Peter Altgeld was a hard man; between him and his son there was no love, only fear and too frequent and too hard punishment. Thus Altgeld's youth was spent with hard work, beatings, and only meager schooling. Then came the Civil War; and the youth, drawn by the glamour and the novelty, driven by a desire to escape his father, went to war. His war years were followed by more hard work—on his own now—in a struggle to become a successful lawyer and politician. With this success Altgeld's real story begins; now he emerges as a great American hero touching off a struggle between democracy and the forces that be, for as Governor of Illinois, he pardoned the convicted Haymarket anarchists. Before his defeat he captured the Democratic Party from Grover Cleveland and defied every newspaper in the land, winning an abiding place in the hearts of the American people. This is not the end however; his last days are even more dramatic, and it is now that he stands forth as the truly great *American*.

Howard Fast is a young novelist of great achievements, and *The American* is, perhaps, his best and warmest book. He has presented an intriguing portrait, against the background of America's coming of age, which hold one's interest from beginning to end.

Wrath in Burma

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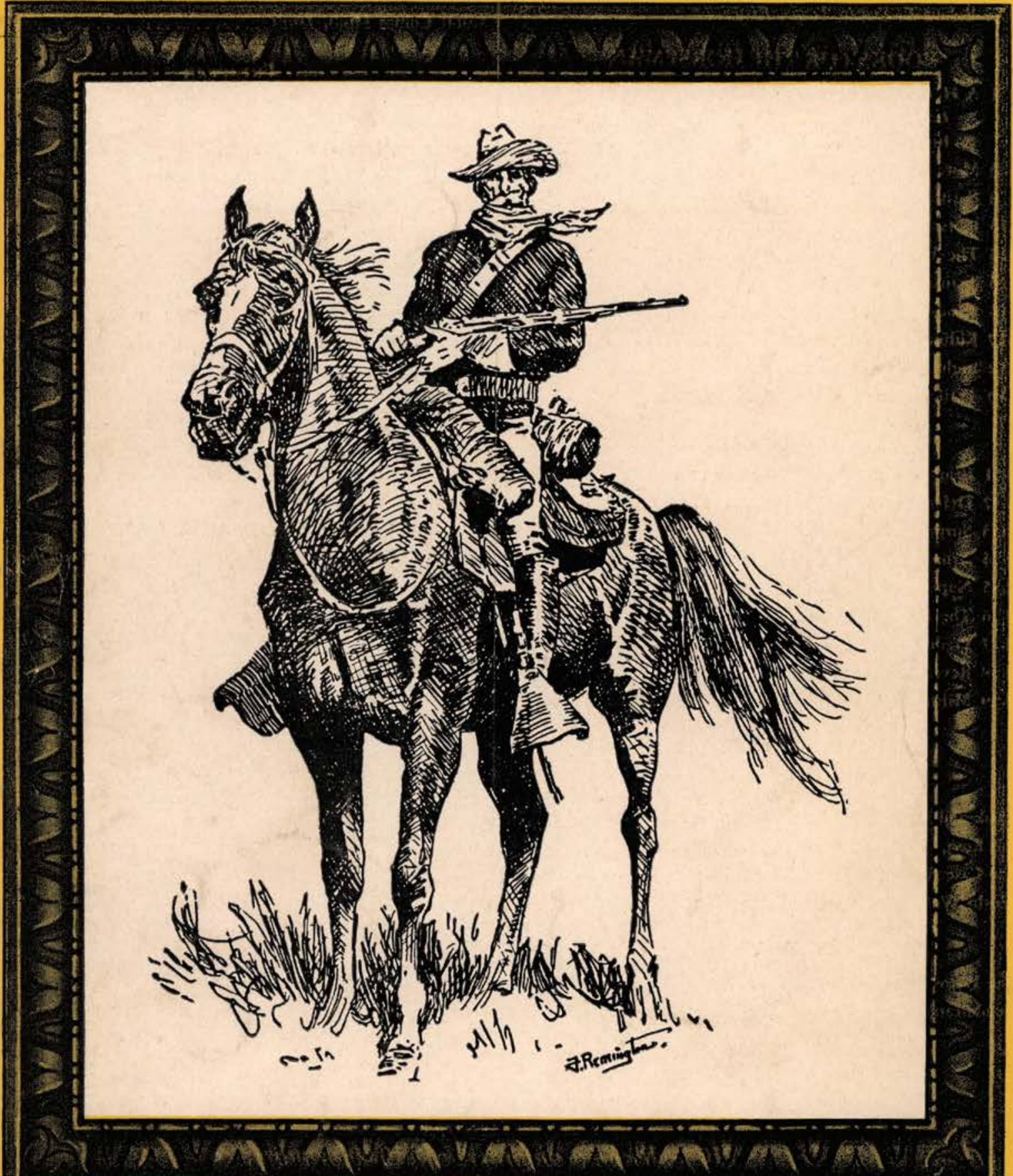
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Doughboys and tanks going into action in the Philippines. This photo was salvaged from the camera of Lieutenant Robert Fields, Signal Corps Photographer, who was killed in action shortly after the picture was made.

Signal Corps Photo

SEPTEMBER-OCTOBER, 1946

The Saga of Number 311

by Lieutenant Commander Norman Myrick, USNR

The hog fanciers knew her as a promising Duroc. The Crossroads scientists on the laboratory ship *Burleson* knew her as a number. The society with the long name knew her as a challenge.

She was a California pig who joined the Navy in company with several thousand other animals, pigs, goats, rats, guinea pigs, to serve as living instruments in the task of tracking down the secrets of nuclear fission. Like all good sailors she was given a number and a battle station. The number was three eleven, the battle station, the Japanese cruiser *Sakawa.*

USS
BURLESON

On the morning of 1 July 1946 the little pig was a nobody. On the morning of 3 July 1946 she was a porcine celebrity. Such is the effervescent nature of fame. It happened in this fashion.

The *Sakawa* was anchored in Bikini Lagoon among the Marshall Islands. Surrounding her were some twenty-two other ships designated as targets for the Atomic Bomb. At nine o'clock on the morning of July 1 the bombardier of Dave's Dream, a B-29 airplane, pressed his release button and the first atomic bomb ever to be released against naval craft arced down on the target fleet. The *Sakawa* was sorely hurt and the following day she slid quietly under the waters of the Lagoon to keep a rendezvous long overdue. About four hours after the *Sakawa* went down the crew of a salvage boat found a pig swimming in the radioactive waters of the Atoll in the vicinity of the *Sakawa's* demise. It was number 311.

The little pig was picked up and taken back to the *Burleson.* The skill and knowledge of the nation's foremost scientists were mobilized to aid in the long struggle for survival that was to follow. On the U.S.S. *Appalachian,* Crossroads Press Ship, one hundred and twenty newsmen fed the story to the four corners of the world. Here was a heroine who had met the thunder of the atom and survived. Here was one who had swum in waters fairly sparkling with radioactivity and lived to grunt about it. Here was a story. The science people saw a profound significance in the pig's deliverance. The sob sisters found a great pig-interest story and the breeders of hogs from Maine to California grew expansive in the golden noonday of pig publicity. At Dallas the authorities made a bid for her personal appearance at the State Fair. At Seattle a swimming race exclusively for pigs, known as the Bikini Derby, celebrated her triumph over the atomic bomb. On the *Burleson* the bitter fight for life went on without surcease.

The will to live was strong in the little pig. The medical resources of a Joint Task Force are formidable. The old man with the scythe was forced to retire. The recovery was complete. Indeed there was talk that the heroine will soon fulfill her destiny as a girl pig. It is said that the patter of little pig's feet, perhaps somewhat radioactive, will bring added luster to the proud number of three hundred and eleven.

Whether or not the little pig resents this intrusion into the most intimate corners of her privacy we do not know. All that we do know is that she who was doomed to die in the interests of science and the atomic bomb has taken her place with the little pig that went to market and the conqueror of the big, bad wolf, among the pigdom immortals.

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CARDE

PATROL TO

by Captain G.

Captain George S. Andrew, Jr.,
interesting patrol stories to co
story of 36 American soldiers i
jungle. Captain Andrew is rapi
fessional writer. See his story
in the July 27, 1946, issue of T

"YES, there're Japs in there, alright."

The stocky lieutenant sat down on a camp stool and looked ruefully at his bandaged hand.

The captain didn't say anything. Out in front of the troop headquarters tent an ambulance crew was loading into their vehicle a litter case, a wounded native and a walking casualty.

The captain was annoyed. Not because his patrol had been ambushed right on top of its objective, but because the man on the litter, with his guts full of grenade, was to have been made a first sergeant tomorrow. Patrols sometimes got themselves ambushed, but good First Sergeants were hard to come by, what with rotation, and jaundice, and Jeez knows what-all. Anyway, it was starting to rain again—great big drops that fell like tracers through the headlight beams of the ambulance. It was after midnight, and the patrol had spent most of the day and half the night bringing the wounded men back through the jungle to the camp on the beachhead.

The captain turned back to the lieutenant. "What happened?"

"In brief," answered the lieutenant, "we reached the ridge in front of Saoeri the second day, and left the trail to cut our way through the woods. After circling around to our right front, we climbed those damn coral cliffs and started down the other side, moving back in to where we thought the left flank of the Jap perimeter should be. Pretty soon Eddie, who was point man with a native, spotted a Jap getting water from a well at the foot of the ridge. We get ready to move in and give that 'skivvy' the heave-ho when all hell breaks loose. They had a machine gun in a tree, and there must have been other guys in the other trees right over us. They started dropping grenades on top of us like they were pickin' apples in an orchard. That first Jap stands up, and Eddie knocks him into the well with one shot. About that time a grenade lands at my sergeant's feet, and he dives sideways just in time to catch a lot of splinters in mid-air. Then somebody back in the rear guard uses his head and starts launching rifle frags into the tree tops in front of us. We hear a squawk and see another Jap dive down from the top branches. A knee mortar starts working on us, and our natives 'go to the bush', after chucking our radio down the cliff where we can't get it."

The lieutenant stopped his story a moment, fished a rather damp cigarette from his jacket pocket, and continued: "About that time I figure we've found out where one flank is anyway, so we scoop up the sergeant and get the hell out of there. Sometime later, it seems like a long time later, too, we get back to the trail and throw up a perimeter of our own while the medic works on my sergeant. Eddie needed some patchin', too. Then the medic says the sergeant is in bad shape and might need a surgeon. It's a question of spending a few more hours nibbling around those Japs while Bill bleeds, or of starting for home right now. We build a litter and start for home. If you think that jungle's rough travelin the daytime, you should try it after dark—particularly that damn swamp. We wouldn't have made it before morning if Miller and his boys hadn't come out with flashlights to meet us, after the native brought you the message. Boy," he added, "am I bushed!"

A trickle of rain began to seep across the headquarters tent floor, and a dozen or so little green bugs buzzed around the Coleman lantern.

"Okay, Lee," the CO said, "get some sleep, and you and the clerk write a detailed report first thing in the morning. I'll see G-2 tomorrow, but I don't think he's going to like it too much."

G-2 was not overjoyed; neither was G-3. Here it was July 23, 1944, the Biak operation was supposed to be history by now—according to the papers back home—and yet native reports kept coming in to division headquarters which told of organized enemy groups gathering in isolated coastal villages on the other side of the island. Fifty Japs here, fifty Japs there . . . it all added up to more trouble, since these Japs seemed to be well armed, aggressive, and in some cases well stocked with rations which had been dispersed all over the island some weeks before D Day. Then there was that Jap battalion which had not been committed during the fight for the air strips. Prisoners said it had withdrawn to the north coast of Biak, and had evacuated large quantities

SAOERI

S. Andrew, Jr.

ells one of the most exciting and
out of World War II. This is the
heir fight against a Jap-infested
establishing himself as a pro-
he 41st Didn't Take Prisoners"
Saturday Evening Post.

of food and ammunition to an obscure place called Saoeri. Captured documents indicated a plan whereby the defeated enemy was to rally in platoon and company groups, each with an assigned village, garden, or jungle area. By keeping hidden from air observation, living from the produce of inland gardens and hidden ration dumps, and by maintaining contact by a well organized system of runners, these Japanese troops would rendezvous in the near future and launch a last, surprise *banzai* attack to drive the Americans back into the sea.

The enemy plan was, of course, a forlorn hope. Biak was taken from the Japanese Army for good and all. But G-2 and G-3, now in their second year of fighting Japs, could see how these enemy remnants—if given the opportunity to reorganize—might some night play hob with the efficient operation of an air base. It was impossible to throw a closely knit perimeter around miles of air strips, docks, dumps, hospitals, and beach installations. And those big, shiny bombers in the dispersal bays, the great stacks of gasoline drums, and the palatial encampments of the 5th Air Force, certainly were a temptation to any raiding body of troops—particularly troops with as much fight left in them as this gang of Japs seemed to have.

Early in the game it was evident to G-2 and G-3 that the future "rendezvousing" of the scattered enemy must never be permitted. But how? Of course, you could comb the whole island with large fighting patrols, but the poor Doughs had been pushing Japs around ever since the division went after Hollandia and Aitape months ago. In that time, the division pulled four full-scale assault landings in 36 days. In short, the men were tired, many were sick, and the division was waiting for badly needed replacements. Couldn't some other means of mopping up these Nips be found?

G-2 and G-3 thought, looked at the maps and then at each other, watched a squadron of fighters circling to land on the recently captured strips, and came up with a plan. The air-liaison officer was called in.

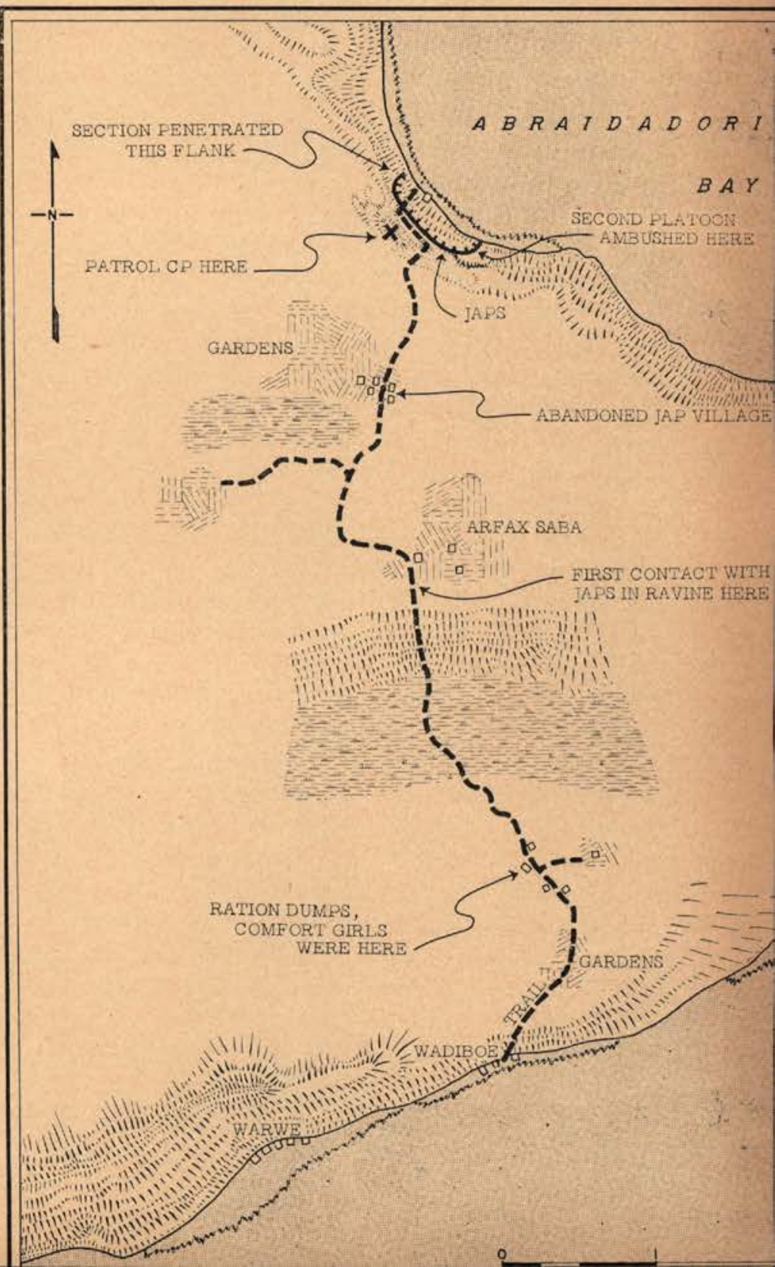
"Out there," said G-2, making a vague sweep of his arm toward the interior of the island, "are Japs. Lotsa little Japs hiding in bunches in the jungle."

Air-liaison blinked and nodded.

"If," said G-3, moving in for the kill, "if we found 'em, could your fighters bomb 'em?"

"Sure," said air-liaison.

Thus a strategy had been devised whereby reconnaissance patrols, investigating native reports, would locate the many enemy bivouacs, mark the locations on maps or air photos, then stand back while fighter-bombers encouraged the Jap troops to seek residence elsewhere. The plan was a good one. The Japs, reasoned G-2, are tired and somewhat discouraged, and they aren't eating too well. They don't like to be strafed. If they know our air force knows where to find them, they will keep moving. If they keep moving, they will become more



ABRAIDADORI
BAY
N
SECTION PENETRATED THIS FLANK
PATROL CP HERE
SECOND PLATOON AMBUSHED HERE
JAPS
GARDENS
ABANDONED JAP VILLAGE
ARFAX SABA
FIRST CONTACT WITH JAPS IN RAVINE HERE
RATION DUMPS, COMFORT GIRLS WERE HERE
GARDENS
TRAIL
WADIBOE
WARWE

tired and discouraged. If they become more tired and discouraged they will stop moving rations from one spot to the next. If they stop moving rations they will starve, get weak, get sick, and die. If that happens, there will be no big *banzai* on the air base some night. Then, when we get our replacements, we can break them in on jungle fighting by letting them mop up the remnants.

It was a result of this strategy that brought the CO of the division reconnaissance troop to division headquarters the morning after his patrol had brought in their wounded. It was true, he told G-2 and G-3, that there were Japs at Saoeri, just as the natives said. They were somewhere up on the forest-covered cliffs overlooking Abraididori Bay. How many, he couldn't say, but they were apparently well armed, had grenades, maybe a knee mortar, and at least one machine gun. And because this machine gun was in a tree, it was a safe bet that there were few others on the ground. "The left flank of their position is about here," said the captain, pointing to a spot on an air photo. He could, he added, take his whole troop up and drive them out, but in those cliffs it would be tough, and he would need better supply and evacuation than it seemed possible to provide.

Again G-2 and G-3 considered. Saoeri was more rightly described as an "area," rather than a village, located on the shore of Abraididori Bay at the northeast tip of Biak Island. Behind a scimitar of palm trees that shaded the beach, and about 100 yards from the water's edge, a series of jungle-covered, coral cliffs rose in terraces reaching 200 to 300 feet above both the coast and the inland terrain. As on most of Biak, these cliffs formed a natural parapet which ringed the edge of the island, and guarded the comparatively flat, inland forest and swamps. Air photos of the area showed two native houses on the beach, and a trail which came from the interior, disappeared into the vegetation of the ridge, and reappeared again on the beach side some 200 yards or so farther to the west. Perhaps, reasoned the photo interpreters, the trail climbed the cliffs from the inland side, turned to the left and followed the top of the ridge for 200 yards, and then dropped down to the bay. "Any way," they said, "if there are Japs at Saoeri they are probably near the trail where it crosses the ridge, for we can't see anything else in these pictures.

No one had ever been to Saoeri except a few natives, and the recon patrol that was there long enough the day before to get a quick look and be ambushed. As the crow flies, Saoeri was only 10 miles from the beachhead, or six miles from the friendly native village of Wadiboe, which could be reached by truck. But American soldiers are not crows, and the trail that crossed the island from Wadiboe to Saoeri was not one to encourage Sunday afternoon strolling.

G-2 and G-3 regarded the recon captain. "Look," they said, "we don't want to start another war on the other side of the island just to chase out maybe only 50 lousy Japs. Just send another patrol to Saoeri, let them find the front and other flank of the Jap position, have them draw a circle on this air photo, and we will let the 5th Air Force lay eggs on it." And so saying they left for their afternoon swim off the reef at Bosnek.

The second patrol to Saoeri was going out loaded for bear. Upon his return to camp, the captain had summoned his most experienced platoon-leader-lieutenant away from a fast game of cribbage. "Look," he said, in the words of the staff, "leave for Saoeri tomorrow with a good strong force. Be back in three days to mark some Japs on this photo." Then he left for his swim off the reef.

The lieutenant called in his platoon sergeant. "Look," he said, "we are leaving for Saoeri tomorrow to locate those Japs on the ridge. Alert our boys, a section from the 1st Platoon, two aide men, and a squad of machine gunners. Have our operators tune up an SCR 284. Send an interpreter to Wadiboe to line up some natives to carry the radio and rations, and get three sound-power phones and a mile of combat wire. Have the non-coms report to me here."

A short time later the platoon sergeant, three section sergeants, and a machine-gun corporal were grouped around a plank table with the lieutenant. The air photo was passing from experienced hand to hand until the officer retrieved it and uncurled its edges on the table along with the not-too-accurate map of western Biak.

"As you probably know," said the lieutenant, "we are going to that place on the other side of the island where the 2d Platoon got shot up yesterday."

The noncoms nodded wisely and waited.

"According to G-2," the officer continued, "natives report at least 50 Japs and maybe more at this place called Saoeri." The lieutenant indicated the map. "Also, G-2 says there is a Jap battalion, or part of it, dispersed in groups somewhere in this part of the island. The Saoeri Japs are probably part of it. This battalion has not done much fighting, if any, since we landed, and should be in pretty good shape. Midway between this side of the island and Saoeri is a place called Arfax-Saba —which is a native garden area. Just beyond that, the Nips built a large village and recreation area. According to the best of speculation, these Japs we are after were in the rest area when we landed. But instead of coming down here to fight they are supposed to have taken all the rations and other truck from the village and withdrawn to the north coast of the island. Some of the rations are supposed to be stored at Saoeri."

Somebody was passing cigarettes and the lieutenant took one as the pack went by.

"Now," he continued, using a burnt match as a pointer, "the 2d Platoon followed a cross-island trail to about here," he pointed at the map, then circled through the jungle to the right, climbed the ridge, and ran into trouble about here." There really may not be many Japs at Saoeri, but even a few—if they're dug in and in caves—can cause a lot of trouble if you try to dig them out. Besides, you know they probably have some machine guns."

Again the noncoms nodded, and looked even more wise.

"But!" And the lieutenant beamed, "We are not going to attack this bunch of skivvies—the air corps is—all we have to do is find exactly where they are!"

No comment from his audience, but a couple of sardonic grins were in evidence.

"Now I've got a plan, and if any of you guys have a better one, let's hear it. Tomorrow morning we will pick up some native scouts and carriers at Wadiboe, cross the island, and follow this trail to where it starts over the ridge at Saoeri. We should get there the second day, because we'll take it easy. I think that the Saoeri Japs probably have a perimeter, bivouac, or something grouped around that part of the trail. It must run along the top of the ridge before it drops down the other side to the bay. The 2d Platoon ran into trouble on the ridge not far to the right of where the trail disappears. Now, we'll leave the trail on the *left* side at the base of the ridge, and set up a small perimeter of platoon headquarters and a section in the bush. Then one section will climb the ridge directly to our front, and, if I am right, it will bump into the center of the Jap establishment. Another section will move along the base of the ridge—and parallel to where I think the trail must be on top—until the sergeant thinks he is past the point where the trail turns down to the bay. Then that section will climb the ridge to the top, turn back to the right again, and work its way down the crest until it contacts the enemy flank. We will take sound-power phones, and the two sections will lay combat wire as they go. We will have a radio to keep in touch with troop headquarters, and I will want progress reports as you go. Besides, once the wire is laid, you can follow it back down the ridge and eliminate the chance of getting lost in those weeds. Are there any questions so far?"

A short discussion ensued, the upshot of it being that the plan couldn't be so bad if no one was dumb enough to get his tail shot off in its execution. With that fine point decided, the lieutenant talked for awhile about rations, ammunition, when to be ready to leave in the morning, and finally dismissed the men.

The noncoms went off, first to talk with their men, and then to swim off the reef. The lieutenant didn't go swimming that day. He was on the field phone trying to talk division artillery into flying him over Saoeri that afternoon in an artillery liaison plane.

The morning dawned bright and dry. Before the breakfast mess kits had been rinsed, sweat had begun to appear on anyone who moved faster than an amble. One degree from the equator is not a locale for excess energy. But that was not why the patrol was late in hitting the trail from Wadiboe. The lieutenant should have known better, for he had been dealing with natives for some weeks now. The procedure was always the same.

"Tabe, Tuan," came the greeting from the first adult or child he met.

"Tabe, mana kepala?" he answered, asking for the local chief.

After an interminable period, he was passing out a cigarette to the *kepala,* and in lousy Malay was asking "whereinell" were the carriers and scouts the sergeant had yesterday made arrangements for. Eventually the required natives were gathered on the scene, and after a great deal of maneuvering among themselves for the lighter loads, plus general Neanderthal gold-bricking, the carriers were ready and the patrol got under way.

By midmorning the patrol filed out of Wadiboe, and was climbing the ridge in back of that village. If fever, foot rot, and a few casualties had not taken their toll, the patrol would have been composed of three 12-man sections of trained scouts, four machine gunners and two radio operators, two medical aide men, the lieutenant, and his platoon sergeant. As it was, the group totaled about 36 men, not counting the accompanying natives.

The men were not new at their business. Originally they had been cavalrymen—drivers, mechanics, gunners, motorcyclists, and what-have-you—of the division's mechanized reconnaissance troop. Back in 1942, when the Japs didn't get to Australia, the division went up to New Guinea to find them. At that time the troopers were deprived of their scout cars, and were reorganized and trained as dismounted scouts. In two years they had learned their new rôle, and considered themselves experts.

They were dressed mostly in camouflage herringbone twill, fatigue hats, and very light packs. Beside the machine gun, their arms were, for each, a knife, two grenades, and either a rifle, carbine, or Thompson submachine gun. Each man carried the gun he preferred, and there were as many of one as of another. Some men had brown handkerchiefs tied around their foreheads to keep the sweat out of their eyes. They all moved with the slow, relaxed step of men used to marching in the tropics. Once out of the village they stopped talking. They watched the tall treetops ahead, or the few yards they could see into the jungle on their flanks. A blind man 20 yards off of the trail might easily not have heard them pass.

As the patrol reached the top of the Wadiboe ridge and started down the rather gentle slope on the other side, a four-man scout group moved out in advance of the column—the first two men watching to the front, the other two keeping an eye to either flank. They were never out of sight of the head of the column where, with the lieutenant, a man with a BAR marched ready to give instant covering fire to this point group. At a word from the officer, a native in a pair of shorts and a dirty GI undershirt left the main body and ran to join the four men in front. He was Dimienoes, the 16-year-old son of the *kepala* of Warwe village, who had attached himself to this recon platoon ever since his first patrol with them. Dimienoes had already accounted for one Jap with the long, pig spear he carried—and he could sense the presence of an enemy with the instinct of the native whose war-loving ancestors were feared throughout western New Guinea. He was, in short, the original jungle scout.

From the ridge, the trail wound through a lightly timbered area, crossed a ravine on a native bridge, and entered a large clearing that had formerly been a native garden. The patrol crossed the clearing without incident, after sending a four-man scout group around either edge, and filed into an expanse of that heavy, rain forest called, for good reason, jungle. For some distance, at intervals along this trail, the Japanese Army had now and again constructed large, native-type shacks. Rotting fish casks easily identified an occasional ration warehouse; another had been a bakery; a third, sitting off on a side trail, had very obviously been the quarters of a group of "comfort girls." Each house, before it was passed by the patrol, was checked for signs of any recently scavaging enemy who might have returned to the area.

Some time later, the winding trail began to descend. The men noticed that the big trees which had hemmed them in on either side were getting fewer in number until suddenly, upon rounding a bend in the track, the patrol was standing on the edge of what the natives called a *"sago"*—one of those swamps in which only the giant, fern-like sago palm will grow. As swamps in that part of the world go, this one wasn't so bad. The season was dry enough so that the area was not inundated. Instead, there was a footing of thick, sticky mud about the consistancy of the mess sergeant's chocolate pudding. It did not smell so good, though.

Many months before, the energetic Japs who had occupied the island had made a halfhearted effort to lay a corduroy footing of logs. But as time passed, frequent high water had floated most of them away, so that crossing the mile-wide area meant mostly wading through mud anywhere from shoe top to knee high in depth.

It was when the patrol had floundered about halfway into the *sago* that the point group stopped and took cover, while the native boy, Dimienoes, intently examined something in the mud surface of the trail. The lieutenant, after halting the column, moved forward.

"What's up?" he asked.

"I think we've been seen, sir," the advance corporal answered.

The officer followed the corporal's glance. There in the muck, leading in from the other side of the swamp, and then returning in the same direction was what on drier ground would have been called a set of footprints. Someone, walking steadily, had approached the spot now occupied by the point group, had stopped in his tracks, and then had retired with much longer steps. The lieutenant looked at the foot-hole in the mud and saw it was half-filled with water. Then, looking at one of his own tracks, he noticed that water was just trickling into it.

"I think," he said, after a moment, "that our friend, whoever he was, left here no longer than five minutes ago."

By way of confirming suspicions, Dimienoes added, *"Ada Nippon, Tuan."* The native had already decided it was a Jap.

"It may," said the officer, turning again to the corporal, "be just a straggler, or it may be a scout for a bunch of Japs. We'll keep on until we get out of this damned mud, and then stop for chow. Move out, but keep your eyes and ears open. I don't want to fight out in this stuff." The point moved gingerly on through the swamp, and the lieutenant signaled the rest of the patrol forward.

The remaining slog through the swamp was uneventful. Where the trail began the ascent to drier ground, the patrol halted at a sluggish little stream, threw out a small security force, and proceeded to fill canteens and break open K-ration cartons. The biscuits, as usual, were thrown away or given to the native carriers; the cheese, or meat, was eaten without enthusiasm. The platoon sergeant moved among the men, chanting his litany of "use them damn Halizone tablets in this creek water."

Nearly two hours later the patrol was working its way up and down a series of small ridges, more rightly described as embankments. The brief halt for lunch was long past, and already the men felt they had been marching without a break since midmorning. The trail had widened to a degree that permitted the equatorial sun to cut through the canopy of rain forest, which ordinarily should have shaded the way. Even though the men proceeded slowly and cautiously and followed a set of hob-nailed footprints, now and again visible, the least expenditure of energy seemed to soak their jackets with perspiration. The lieutenant halted the patrol, held up five fingers to signal a five-minute break, and sat down in the shade at the edge of the trail to wipe the sweat streaks from the lenses of a pair of GI specs. Beside him, a lackadaisical conversation was being held in an undertone.

"Damn, I wisht I was back in Portland!"

"Aw, you ain't ever had it so good. Whatcha got in Portland you can't get here?"

"Lots of things, there's. . . ."

"Yeah, and two-bits she's livin' with a shipyard worker, now."

The officer took a long pull at his canteen, and looked at the map he had unfolded on his knee. God knows where they get the information with which to make these maps, he thought. Everything along the beaches and for 2,000 yards inland mapped to the last little bush; everything else just one solid color. They ought, he thought, to print the word "UNEXPLORED" in big letters across that part of this map indicating the interior of this island, like they do on maps of the South Pole. Yeah, here are some notes down in one corner. *"CAUTION: This map was produced from aerial photo-*

graphs. Due to lack of accurate ground control, distances scaled on this map may be at variance with actual ground distances." And in small print under the scale, *"NOTE: Officers using this map will mark hereon corrections and additions which come to their attention and mail direct to The Army Engineer, Sixth U.S. Army, A.P.O. 442."* "Sure, anything to oblige, Colonel! Corrections or additions which come to my attention . . . What a war!"

The lieutenant folded the map and signaled to the native, Dimienoes. In bastard Malay, plus much scratching of diagrams on the ground with his knife, the officer learned eventually that Arfax-Saba, the native garden area a little more than halfway on the route to Saoeri, should be no more than a few minutes march down the trail.

Arfax-Saba was one of those places along a jungle trail at which you arrive almost before you realize you are there. Years ago, no longer being able to ply their once-profitable diversion of raiding the villages of other islands, the coastal natives of Biak cleared large tracts of jungle on their inland plateau. There, communal gardens were established from which the women drew an assortment of tropical vegetables to supplement the native diet of fish, coconuts, and Dutch government rice. But since the coming of the *Amerika* to Biak, and the flight of the Japanese into the interior, few natives ventured far into the island, unless they went to hunt the Japanese—for which they were paid at the rate of one Guilder per right ear, delivered. Arfax-Saba was one of these gardens, perhaps a half-mile square, now abandoned and rapidly reverting to jungle.

The trail to Arfax-Saba did not cross this open area. Instead, it came out of the forest, and decended into a small, elbow-shaped ravine that bounded one corner of the garden. Standing at the elbow where the trail dropped into the ravine, the patrol leader was able to see to his right front the open sky over the garden, and the roofs of some shacks, for the bank of the ravine was higher on the garden side, and the clearing itself was in defilade. Directly in front of him, the trail ran along the bottom of the ravine for about 100 yards. There the ravine ended at a smaller embankment upon which was built a native shack. The trail climbed this embankment, passed to the left of the shack, and then turned abruptly to the left and away from the garden area. To his left front, the officer noticed that the bank of the ravine was not nearly so high on the left of the trail as on the right. In fact, it was only about head high, and was bordered partly by the wall of the jungle on his immediate left, and by the edge of a smaller clearing, to his left front, which was about 100 yards square. It was around the far corner of this smaller clearing that the trail turned to the left and disappeared, flanked by the jungle and the far, bush-lined edge of the clearing.

After one look at the ravine, at the high bank to its right, and the solid jungle beyond the embankment and shack at its end, a very obvious conclusion jumped through the patrol leader's mind: "Brother, what a place for an ambush." It was evident that he was not alone in his estimate. Ahead of him, about halfway up the ravine, the four-man point was advancing almost inch by inch, each man mentally selecting the log, bush, or tree behind which he was going to dive. In front of them, the scout Dimienoes had stopped; aware by instinct that something was wrong, but as yet unable to decide just what it was.

By this time, about eight men of the main body had descended into the ravine, or were making their way down the short embankment. With a low whistle, the officer halted his patrol. The point took cover immediately, and the remainder of the men in the ravine prepared to do likewise, if necessary, As yet, there had been no sign of anything amiss, but then there usually never was.

Two men from the head of his column and the patrol leader worked cautiously up to the high embankment to the right of the trail until they reached a point where they could observe the wide expanse of the garden of Arfax-Saba. All that could be seen was a tangled mass of weeds, dotted here and there with huts built on stilts, all in a state of general disrepair. The lieutenant was crouched on one knee, his back to the ravine with its trail. He was carefully watching the area for any sign of life. To his left, a few yards away, Private Arnett Putnam, a hefty, ex-combat engineer, was similarly engaged, while at the lieutenant's right, Private "Bunny" Barber, a 19-year-old ex-schoolboy, was looking the opposite direction, watching the terrain on the other side of the ravine.

"Hey, Lieutenant! ! !" Barber's stage whisper might have wakened a corpse. He was gesturing across the ravine to his right, where—when viewed from the elbow of the ravine the trail had previously been seen turning away from Arfax-Saba—but where now some 50 yards of it was plainly visible, partly through the bushes which bordered the smaller clearing. Down the trail, marching in file as to a picnic and obviously unaware of the presence of the patrol, came three Japanese soldiers.

"Hey, Put!" stagewhispered the lieutenant, glancing away from the oncoming Japs, and trying to outwhisper Barber in order to alert Putnam. Putnam turned and he pointed. As he did so he saw the Japs, who now were running back up the trail. Raising his carbine, he suddenly discovered how hard it could be to get a running target into the aperture of that little rear sight. He fired anyway. Next to him he could hear the crack of Barber's carbine, and the rapid, reassuring bark of Putnam's M1. Jeez! All three Japs were still running! But by now they were nearing a few bushes. This, thought the officer, will be like firing at ducks in a shooting gallery. And so, he aimed at a bush in front of a Jap, and as the man disappeared behind the vegetation, the lieutenant fired a round, not at all like he'd been training his men to shoot. Almost simultaneously, Putnam's M1 barked again. The Jap, who had disappeared behind the bush at a dead run, popped into view on the other side, hit face down on the trail and lay still.

As the Jap fell dead on the trail, eight other Japanese riflemen rose from a hollow behind the shack at the head of the ravine, and disappeared into the jungle without firing a shot. Only Putnam saw them go, and he, between curses, was frantically stuffing a new clip into the magazine of his rifle.

Some hours later, the lieutenant stretched himself out on his poncho, took a drag on a cigarette cupped carefully in the palm of his hand, and hoped that the last edges of daylight would stay with him long enough for him to finish the butt before dark. The patrol, now a mile and a half beyond Arfax-Saba, had pulled off the trail an hour before nightfall, and he had established a small perimeter on a knoll in the forest. The platoon was deployed, three men to a group, each group behind what hasty log breastwork it had found time to construct, and each within almost spitting distance of others on their flanks. The tight little circle enclosed a small patch of jungle wherein were settled the natives, the aide men, and the platoon headquarters group. Those damned natives, thought the lieutenant, were making too much noise. They always did. Although he was positive that the patrol had slipped off the main trail unobserved, he was always nervous just at dusk and dawn. If nothing happened before it was dark, he was sure the platoon would be unmolested by any wandering Japs. Anyway, the machine gun and his three BAR's were well placed.

He snuffed out his cigarette, started smearing mosquito dope on his hands and face, and mentally reviewed the events of the afternoon. At Arfax-Saba, when he fired the first shot, the platoon had automatically deployed under the watchful eye of Sergeant Miller. But it was unnecessary. The whole affair had been over in less than a minute. The Japs had faded into the bush, leaving their dead sergeant on the trail. He had sent a small force up the trail after the two that ran that way, advanced the platoon through or around the ravine, and halted to search the corpse. He had wasted a lot of time setting up the radio and trying to notify troop headquarters of the enemy contact, but had discovered that the radio wasn't working—as usual. The native carriers had probably dropped it too hard when the shooting started. After a thorough search, the lining of the dead Jap's hat had given up a brass dog tag and, more important, a crude pencil sketch of what might be the Jap position at Saoeri. He had immediately started four men back to camp with this find and a report. He couldn't spare four men, but you couldn't send fewer through an area well-known to the enemy, and you couldn't trust a native to get beyond his wife in Wadiboe before morning.

After packing up the radio, they had started down the trail again, and had rejoined his advance party at a trail junction a half hour later. The two fleeing Japs had been joined by others, according to the footprints, probably the group Putnam had seen pulling out from behind the shack. Some of them had taken the trail to Saoeri, and some had gone down the branch trail which led off further to the left. He had sent a party to follow them for a short way, and the group had been too long in returning to report another garden area some distance down the trail, but no further sign of the Japs. Before the whole patrol had again assembled and resumed the march toward Saoeri, a lot of time had been wasted, and it was getting late. They had gone only a short way before it was time to start looking for a bivouac. By this time, the canteens had only a little water left in them, and he kept hoping to find a stream. At length, they were all forced to make camp without refilling the canteens. They had crossed only one stream all day—the one at the swamp—which was rather unusual in that climate.

The officer wiggled his stockinged feet, leaned back, and propped his shoes under his head. "Miller," in a low voice he spoke to the sergeant stretched out at his side, "did you notice anything about that Jap we knocked off this afternoon?"

"Sure, Lieutenant, he was the biggest bastard I have ever seen wearing a Jap uniform," came the reply. "Jeez, he must have been over six feet."

"Anything else?"

"Yeah. That guy was healthy, and he was well fed. When we pulled his shirt up to search him, I noticed a roll of fat on his belly. Even if he was a 'sargint,' that's unusual for Japs on this island nowadays. Furthermore, his rifle was clean, oiled, and no rust, and his clothes were in better condition than mine. Lieutenant, that guy hasn't seen any action in this war since he left China."

There was no doubt about it. The Japs they had run into that day were from the missing battalion; the one that had withdrawn to the north coast of Biak early in the fight for the island. The lieutenant tried to reconstruct the probabilities. After the 2d Platoon had pulled the patrol to Saoeri, the Japs there had probably taken steps to prevent another Yank patrol from arriving unannounced. They probably had sent a security force down the trail into the interior of the island, or else they were growing short of rations, and were sending foraging parties out to the native gardens. At any rate: 1. a party of Nips was at Arfax-Saba today, 2. it had sent a scout along the trail toward the swamp, and 3. it had learned of the approach of his patrol. An ambush—and a lousy one at that—had been prepared at Arfax-Saba. Why the Japs had not spread out along the high edge of the ravine, he would never know. Instead, they were hiding in a depression at the head of the ravine, waiting, he guessed, to give the patrol hell when everyone got into the gulch.

But why the three Japs marching down the trail? The only way he could figure it, the three had left their main group earlier in the day, and had returned at a most inopportune time. They were walking down the trail as if they owned it. In the few seconds he had been trying to get Putnam's attention, the three Japs must have received a signal from their hidden comrades, and taken off up the trail at a dead run. Anyway, the fat was in the proverbial fire now, because all except the dead Jap sergeant had gotten away. Their main body at Saoeri were wised-up by this time. Well, it was dark now, and there was not much chance of trouble before morning anyway. The lieutenant began to relax a little.

When he awoke, it was already well past dawn, and the platoon was eating its K-ration breakfast. As usual, the platoon sergeant had refused to awaken him—a fact for which he was secretly grateful. S/Sgt. Donald Miller, tow-headed and belligerant, from Wyoming, was younger than most of the men in his platoon. Known affectionately as "Stinky" by "them boys," he could make them jump through hoops by the lash of his good-natured ridicule, and the sheer weight of his personality. Although the sergeant never knew it, his platoon leader regarded him with all the affection of a brother. They had occupied the same hole together. They had drunk the same bottle of captured *sake* together. In short, they had grown up in the whole damned war together.

"Lieutenant, we've found some water," was the platoon sergeant's good morning.

"Where?"

"Over there, sir."

In an adjacent group of trees, a half-dozen men, under the guidance of two natives, were cutting leg-thick vines away from the trees. After cutting a vine loose, they would hack a point on the loose end. From this point a thin trickle of water would run into the canteen held beneath it. The lieutenant collected a half-cup full, and prepared the breakfast Nescafe.

Nearly an hour later the patrol was halted on the Saoeri trail at the edge of another garden clearing, which to all appearances was much larger than Arfax-Saba. Ahead of them the advance guard, reinforced by flanking groups, was feeling its way through light vegetation toward a group of the largest native-type shacks the lieutenant had yet seen on Biak. These shacks, sitting across the trail where it ran along the edge of the clearing, were evidently the abandoned enemy village that had once been the rest area of the original Biak garrison force. Each shack, large enough to house a company of Japanese infantry, was situated on its own knoll, which rose out of the bumpy terrain. And around each shack, the former occupants had dug a perimeter of foxholes, as if they had once anticipated defending each of the leaf-thatched barracks buildings. Orderly pathways led from building to building, blazed tree trunks were marked with Japanese lettering, and at the edge of the main trail, in front of one house that must have been a headquarters, a huge shinto gate towered above the entranceway. The whole area, as the advance party discovered, was deserted. It had been abandoned with an efficiency that had left behind only a few empty bottles and a broken sack of rotting rice. The platoon filed down a slope into the village, and halted in column on the trail. The lieutenant had reasoned that a village of this size would have been built near water. Four men, sent to reconnoiter a near-by hollow, confirmed his estimate.

A water detail, having collected the canteens, set off down the gully for the water point. The remainder of the patrol settled along the trailside for a smoke. The lieutenant had just lighted a cigarette when the radioman next to him jumped to his feet.

"Hey, Lieutenant!" He pointed toward the rear of the column. Just below the crest of the slope where the trail dipped out of the forest and into the clearing, a trooper was frantically pumping his rifle up and down over his head, signaling "enemy in sight!"

Most of the platoon had also seen. Already men were throwing their packs beside the trail, checking their weapons, and looking to him for directions. The officer ran stooped-over down the trail toward the rear. Midway through the village a small, black snake wriggled across the path in front of him, and disappeared in some brushwood. Later, he had time to remember that it was only the second snake he had seen in two whole years in the tropics. The other had been in his bed a year ago in Papua.

Before he had reached the rear guard, a tommy gun began to fire. It was quickly joined by a BAR, then a chorus of rifle fire. It stopped as suddenly as it had started, while an angry voice yelled, "You trigger-happy rummie! Next time you wait until I say to shoot!"

"But Sarge, I thought they had seen us and were starting to run."

"Listen, damn it, even a Jap can stop to scratch his tail. They would have walked right into us, but now look."

The lieutenant, arriving on the scene, also looked down the trail to where a Japanese soldier sprawled 75 yards away. Three rifles were scattered near him.

"There were three Japs, Lieutenant," the section sergeant explained. "They were following our tracks. We wounded the other two. They're in the bush somewhere. I don't think there were any others behind them, but we'll never know now." The sergeant glared at the man who had fired prematurely.

The officer signaled back to a section, brought them up, and started them cautiously combing the jungle on the side of the trail. They found nothing. Off in the distance he could hear a roar not unlike that of an approaching subway train. He called in the section and started back to the village. The rumbling sound grew louder as the heavy raindrops smacked onto the upper vegetation of the jungle. Within two minutes, while the lieutenant was giving a brief resume of the situation to his other sergeants, the rain rolled over them in an avalanche of water.

A half hour later, the rest of the patrol was feeling its way along the last, muddy mile of trail toward Saoeri.

The tropical shower had passed on as swiftly as it had arrived, and already the sun was drying the clothing on their backs. The officer, now somewhat worried at the delays encountered since leaving the swamp the day before, had decided to push ahead with the better portion of his three reconnaissance sections. The natives, and the operators with their doubtful radio, had been left behind at the village under the protection of the machine-gun squad and a half section of scouts. They had taken a defensive position on a knoll in the clearing, making use of one of the shacks, and the foxholes conveniently dug by the last occupants.

The patrol, now at a strength of about 25 men, was moving all the more cautiously along the trail. The terrain, slightly rolling, was again hidden under the same thick rain forest they had encountered most of the way across the island. The men were not marching. The point group was moving ahead slowly by bounds, searching the trail and vegetation around every bend, and only then signaling the main body forward. After an hour, the lieutenant knew he was drawing close to the inland slope of the Saoeri ridge. He had passed the cut brush at the point where the 2d Platoon had left the trail a few days before to work around the left flank of the enemy position on the ridge.

The lieutenant moved up and joined the point. As they climbed a short rise, the vegetation thinned before them, the trail turned out of sight, and a great bulk of trees and matted vegetation rose in tiers across an open space in front of them. The point man stopped, sniffed the air, and motioned to his platoon leader. The officer moved forward, joined his trooper behind a clump of brush, and peeked through the leaves. The trail wound across the clearing for about 50 yards, started up with a sharp angle at the foot of the first terrace, and disappeared again in the mass of vegetation covering the cliffs.

"Smell 'em?" the trooper whispered.

The lieutenant sniffed. There was no doubt about it. Anyone who had ever smelled that mixture of what stunk like pomade and unwashed carcass would know.

"Let's go back," came the order. Undoubtedly, there was an outpost at the far side of the clearing, covering the approach to the ridge.

The patrol backtracked silently down the trail. After retracing their steps for some 75 yards, a slight break in the bushes, found by Dimienoes, revealed itself as a narrow pathway leading off through the forest to the left of the patrol's original direction of advance toward the ridge.

The patrol filed off the Saoeri trail, worked its way into the jungle along the path, and halted on the edge of a slight hollow around which the pathway continued. As well as he could, the lieutenant estimated that he was now about 100 yards west of the main trail, and another 100 yards from the base of the ridge. He called the sergeants of the two reconnaissance sections forward, gave them instructions, and disposed the remaining half section around the edge of the depression to form a very thin perimeter. A BAR was set to cover the path where it led into them from the main trail.

The platoon sergeant was tying the loose ends of two reels of Signal Corps combat wire to a sapling in the center of the perimeter. To these ends he clamped a sound-power telephone. He handed a reel each to two men who began to unwind the wire as they followed their respective sections.

The two reconnaissance sections, averaging now from 10 to 12 men each, some of which carried additional reels of wire were already beginning to push their way through the vegetation. In no time they had disappeared, leaving only the thin strand of wire leading into the shadow of the forest. The lieutenant unslung his pack and sat down, the phone pressed to his ear as he waited for the first progress report from his section sergeants.

Some hours later, the lieutenant was still sitting. He was no longer listening at the phone, and he was not at all happy. Both of his scouting parties had run out of wire long ago, and he could only guess what was happening. The ridge was apparently rougher than anyone had known. It was a series of cliff-faced, knife-edge ridges of coral, each one rising higher than the one before until the aggregate formed a most formidable escarpment. Apparently, his men had been laying more wire up and down than they had unreeled in any horizontal direction. His sergeants had been emphatic in their phoned reports. "We're doing fair, Lieutenant. Worst damn terrain I ever saw, though." There had been no sign of the top, however, before they had run out of wire. To add to his troubles, a small party of Japs had been heard passing along the trail about an hour and a half ago. They had evidently been returning from inland to their present bivouac up on the ridge, and no doubt had scouted his natives and the few men he had left back at the village in the clearing. Most likely, they were the rest of the group first encountered at Arfax-Saba. Now that his patrol was split into four groups, the Japs, if they were smart, could come out of their ridge and try to deal with the patrol. "If I were the Jap commander," he thought, "I would hit that group in the village about dusk, and get their rations, radio, and machine gun."

He debated a long time. He could continue the scouting operation until dark, have everyone stand fast where they were through the night, and complete the job in the morning. This would leave the small group in the village by themselves, where they might have to fight off a sortie of Japs from the ridge. Or, he could order his scouting parties to return before dark, retire in full strength to the village, then get an early start in the morning and spend as much of the whole day as needed to scout the position on the ridge. This, however, might make him a day late in returning to camp, and they were running short of rations. He wished his unspeakable radio was working. Well, the patrol would have to go hungry. He'd make up his mind. Thus when each of his sergeants had phoned in their last report, he told them to make plans for returning to his position at least an hour before dark, if they had not located the enemy position in time to return with the day's work completed.

Now it was almost time for the recon sections to be returning back down the trails of wire they had been laying through the dismal vegetation. Dimienoes was sent out along one wire line to see if there were sight or sound of men coming back down the ridge. In 20 minutes Dimienoes was back; with him was the group that had started straight up the ridge in an attempt to contact the center of the Jap perimeter.

The section sergeant dropped next to his platoon leader, took the cigarette that was offered, and sighed. "Lieutenant," he said after lighting it, "I have never seen the like. That ridge is a mass of roots, coral boulders big as a house, pinnacles and crevasses even bigger, and one vertical climb after another. It's up, then down, then up a little higher, then down a little farther, and all the time you can't see your hand in front of your face, there's so much greenery growin' around. About an hour after I called you the last time, we got to the top of the highest ridge, with still no sign of Japs or the trail that you thought ran along there. Anyway, we started down the other side, with the same results, but we couldn't go very far before it was time to start back." The sergeant took a long drag on his cigarette, thought a moment, then continued, "About that trail, sir, it's our guess that it must cross the top of the ridge and go part way down the other side before it turns to the left. It must run along the reverse slope up there. Anyway, it's not on the top and neither are the Japs."

The sergeant's explanation seemed logical. The officer looked at his watch. It was time the other section was returning. It was not much more than an hour before dusk now.

A sudden burst of firing from up on the ridge broke the late afternoon silence. The officer jumped to his feet. Miller, the platoon sergeant, came scrambling through the jungle underbrush to the platoon leader's side. The firing had started first with a burst from a tommy gun, then about three quick rounds of what might have been an M1, then silence.

"Miller, what do you think?"

"Them's our boys, Lieutenant."

"Yeah, but what the hell they doing up there? They should be back here by this time."

"Don't look like they're gettin' here tonight, Lieutenant. Sure hope they ain't gettin' into trouble."

"Tip," the officer turned to his other section sergeant, "if those boys started back here right now, how long do you think it would take them, if all that ridge is like what you were on?"

"Two hours—maybe three, sir."

"Hell, it will be dark in less than an hour!"

"Yessir."

"Could anyone move on that ridge in the dark?"

"Nossir."

The lieutenant looked at his watch again. "We can wait only 20 minutes more," he said. They waited. After a quarter of an hour had dragged by, the shooting began again up on the ridge. It started with a single rifle shot, then another and another, ending in a climax of rapid fire. The officer had counted about 20 rounds.

"Well, Miller?"

"Them wasn't our boys that time, Lieutenant." Then earnestly, "I hope to devil that Abner knows what he's doing up there."

"Did one of the medics go with him?"

"Yes sir, Rabinowitz."

"Good."

"What do we do now, Lieutenant?"

The platoon leader exhaled slowly through clenched teeth. "We get this outfit back to the village before dark. We dig in for the night. At daylight tomorrow everyone must be ready to go to Saoeri—hoping that they meet one complete section coming back down that damn ridge."

Already the shadows were getting thicker along the ground, and the heat of day was beginning to fade. The bulk of the Saoeri ridge could be felt, rather than seen, towering above the trees that surround the patrol. The men were beginning to move back toward the trail. As the lieutenant reached down to pick up his carbine, he had the feeling of having just murdered his brother.

The night that followed was perhaps the longest the platoon leader had ever endured. There was no enemy sortie upon the village, a possibility that ceased to worry the officer once he had established the balance of his platoon in one of the old Jap positions. It did not rain; the officer could find no fault with the weather. But he had not slept much, having spent most of the night lying awake in his poncho wondering what had happened to his section up on the Saoeri ridge. Apparently, they had found the Jap position, but then what? Had there been any casualties? If so, how many? Who? The Japs had done a lot shooting in that last, brief engagement. Was the section cut off up there on the ridge; surrounded by dirty little skivvies waiting only 'til daylight to close in on them? Why in hell hadn't the sergeant come back when he had been told to? So, it was with a mixture of relief and impatience that he had watched daylight begin to filter through the heavy forest and across the gardens.

The patrol had been on the trail back to Saoeri for 20 minutes now. The lieutenant was pushing his men forward as fast as he dared, and although they did not anticipate trouble, the point group had watched a dog come down the trail, stare at them a moment, and then turn back down the trail at a fast trot. It might have been a stray, and then again it might have been accompanying another enemy party. Now, thought the lieutenant, would be bad time to be ambushed. The patrol was winding up a slight hill. The lieutenant recalled that on the far side the trail dropped into a little valley, fairly open, which it crossed only to disappear over the next rise in the rolling terrain. The officer was watching his point group as it reached the crest of the hill. Almost with one motion the four men took cover in the brush at either side of the trail. Then after a moment, one man stood up, looked again into the valley, then shouted as he waved the platoon leader forward. The officer joined his point at a dead run, and looked into the hollow beyond. Coming over the crest of the far side, and down into the little valley, were the men he had prepared to count as lost, somewhere on the ridge at Saoeri.

Ten minutes later Sergeant Charles Mann, section leader, ex-barkeep, and known as "Abner" to his buddies, was seated beside the trail with his platoon leader. His left arm was bandaged near the shoulder, and a patch on his chest showed where the same bullet, after passing through his biceps, had creased its way across the flesh under his jacket pocket. So relieved was the lieutenant to find this the only casualty, that he had forgotten his plans to bawl out the sergeant for not returning the evening before. The platoon leader and his sergeant were bent over a rather crumpled air photo the officer had fished from the bottom of his pack.

"We reached the top of the ridge about here, Lieutenant" . . . the sergeant pointed to the photo . . . "about mid-afternoon, not long after we ran out of wire. We tried to turn left and move along the top of the ridge like you said, but the going was so rough that we dropped down the far side—a little better than halfway down. Then we hit this place where a lot of jungle had been cleared. Not the big trees, just the underbrush along a sort of terrace. We turned left and moved along that about 200 yards, I guess, and damn if we didn't come onto the trail where it comes down off the ridge to the beach on the other side. Well, we started sneaking up the trail, and we got to where we could see a big shack on the side of the ridge. From what I could figure, we were right in the middle of the Jap perimeter, if you want to call it that. Just then, a big Jap started down the trail with a towel over his arm, going for a swim, I guess. Anyway, he came so fast we had to shoot him, and then things started to happen.

"We pulled off the trail, and started back parallel to the ridge top again, when we ran into the back of their flank positions. Everybody started shooting at us then, so we turned around, ran back into the perimeter, down the trail toward the beach, and sneaked out the way we came in. We were able to make it back over the ridge, and found the end of our wire just before dark. We took most of the night following that wire down to where we left you, spent the rest of the night there, and started back at daylight."

The sergeant stopped, flexed his wounded arm gingerly, then added, "We would have been back before dark yesterday, Lieutenant, except we kept thinking that just a few minutes and we'd be finding their flank positions. But when we did, it was already too late and we were kinda busy."

The lieutenant looked at his sergeant, started to say something, then changed his mind. Finally, he said, "Can you pick out the flank on this photo?"

"Yes sir," grinned the sergeant, pointing, "right about there, nearly 100 yards west of the trail where you can see it going down to the beach."

"In that case," the lieutenant sighed, "let's get the hell outta here."

Two days later, shortly after dawn, 12 fighter-bombers skimmed over Abraididori Bay, circled in the air over Saoeri, then one after the other dove toward the ridge at a point where a trail could be seen leading out of the trees and down to the beach. When their bombs were expended, the aircraft circled over the bay, not unlike a huge merry-go-round, each plane dipping to strafe as it passed the column of dust and smoke that still rose from under the treetops shading the Saoeri ridge.

Five days after the air strike, a troop clerk sitting in a headquarters tent wrote in the troop diary: "August 2d: The third patrol to Saoeri returned to camp. The patrol had seen only one Jap, and he was killed by a native guide. No sign of the enemy was found in the Saoeri area. Natives have brought in a report that there are Japs living at a garden near. . . ."

Over in a corner of the tent the troop commander was on the field telephone talking to G-2. At a table, another lieutenant and his sergeants were looking at another air photo.

"Now, some natives report . . .," the lieutenant began.

Outside, it had started to rain again.

* * * *

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The Nazis Were Winning the Battle of the Atlantic -- Then --

Sonar Beat the Sub

NEITHER the Axis powers nor the Allies were prepared for extensive submarine warfare when World War II began. The Germans had about 20 500-ton and 10 750-ton ocean-going U-boats. The British had fitted their "ASDIC" (British word for sonar) on 165 destroyers, 34 small patrol craft and 20 trawlers, and the United States had about 60 destroyers fitted with echo ranging sonar.

The underlying principle of ranging sonar is the principle of the echo. Sound waves are sent through the water, and are echoed back to the sender when they strike an underwater object.

Sonar had progressed remarkably from 1918 to 1939. The capability of the World War I listening apparatus was limited to indicating the presence and general area of moving U-boats. At the beginning of World War II, we had ships equipped with sonar capable of detecting U-boats that were surfaced, submerged, underway or lying still. We also could tell their bearing, distance, and almost exact location.

When the United States indicated its intention of making common cause with the Allies, the exchange of scientific knowledge was resumed between this country and Britain.

The first year of World War II was a typical blitzkrieg. The Norway invasion in April, 1940, provided more U-boat bases, and Italy brought about 100 submarines into the war, of which 60 were ocean-going. The use of French ports, starting in July, 1940, extended the U-boat's westward range. The spotting of approaching convoys by French-based aircraft compelled Allied ships to take longer routes north of England. The obvious preparations for invading England during August, 1940, forced British antisubmarine ships to guard the coasts of the British Isles. This diversion of asdic-equipped escorts from convoy duty resulted in U-boats reaching their highest effectiveness —each sinking about 10 ships a month.

In 1941, the British captured the U-570, one of the only two U-boats taken during the war. It proved to be a valuable source of information. Its sound equipment included an underwater telegraph system containing a pair of small transducers mounted flush with the U-boat's skin. The German submarine also carried a long-range listening device containing an array of 24 three-inch diameter microphones on each bow which were fed through a phasing network to an amplifier and earphones. It was not accurate enough to fire torpedoes by, but convoys could be heard about 10 miles away under good water conditions.

When the United States entered the war, the Navy's 170 destroyers were the only United States surface craft fitted with echo ranging sonar. Three-quarters of them were engaged in cross-Atlantic convoying, the others were employed in the Pacific. Our unescorted Atlantic seaboard shipping was slaughtered at the rate of 75 ships a month by an average of 38 U-boats, of which we killed about three a month. Many of these sinkings occurred within sight of our coasts. The 75 Japanese submarines were sinking 10 ships a month in the Far East.

Meanwhile, the Bureau of Ships was equipping all available torpedo boats, sub chasers, motorboats and yachts with lightweight sonar. Production facilities were greatly expanded. The British lease-loaned us 10 Corvettes, having first trained our crews in England to use the asdic, and we obtained 24 asdic-fitted, small patrol craft from Canada. By March 1942, coastal convoying was begun with a small number of ships and land-based planes.

During this period U-boats were sinking ships faster than we replaced them, and we were losing the Battle of the Atlantic. Our success in attacking submarines after we detected them was less than five per cent—95 out of 100 got away. Sonar was detecting the U-boats, but in the crucial moments of the attacks, something was inadequate.

To find the solution, we adopted the best known methods of convoying, asdic screening and searching, and our attack successes increased.

The engineering groups enlisted the aid of additional manufacturers and furnished a gyro-controlled device to keep the sonar beam directed on the U-boat during an escort's maneuvers or turns, an electronic scope to indicate visually whether the sonar beam tended to lose contact due to the operator moving the beam either to the right or left of the U-boat, and a control device which reduced the heavy reverberations resulting from sudden sonar "pings" which cause the surrounding water to act like an empty hall with bad acoustics. The control device also reduced undesirable interfering echoes from seaweed, shallow water bottoms, tidal currents and ships wakes.

The effectiveness of the improved Allied antisubmarine measures was demonstrated when history's greatest invasion armada of about 1,065 vessels made passage in November 1942 from United States and United Kingdom ports for the coast of North Africa. Although some 40 U-boats were lying in wait, they sank only 23 ships during November. Gross Admiral Doenitz observed, "The surprise Anglo-American landings in North Africa called for a concentration of U-boats on both sides of Gibraltar. Every U-boat that could reach these waters within 10 days was mustered. Defense in these African waters was very effective—and U-boat losses were correspondingly high."

During 1942 some 1,573 ships were sunk. The average was 131 a month. The Germans kept an average of about 80 U-boats at sea out of their pool of about 360. The sonar-asdic-fitted escorts totaled about 800 ocean-going types. Eighty-two U-boats, 20 Italian and 16 Japanese submarines had been sunk, an average of 10 a month.

Early in 1943 the general locality of surfaced U-boats which transmitted reconnaissance data by radio signals was detected from long distances by high-frequency radio direction finders installed ashore and in escort vessels. The U-boat localities were then searched by land-based and escort carrier planes equipped with radar, which became increasingly effective since U-boat radar intercept receivers were unable to detect the short waves employed. Radar contact was lost once the U-boat submerged, which required about 40 seconds. Planes then parachuted floating expendable radio-sono buoys. Their suspended underwater sonar hydrophones could detect U-boat noises which activated the buoy's radio transmitter. Such transmissions, when received in the planes or near-by escort vessels, indicated the U-boat's area which was then swept by sonar-asdic-fitted escort ships for accurate location and attack.

In the early summer of 1943 an average of 120 U-boats were operating in the Atlantic. U-boat packs were frequently outnumbering the escorts by two to one. Two convoys traveling close together were attacked by about 40 U-boats which sank 20 ships. Another convoy of 33 ships protected by eight escorts was attacked by a pack of about 20 U-boats, which sank 12 ships during the midnight hour. The same pack re-attacked the next night, but none of the remaining 21 ships was lost. Twenty-four individual U-boat attacks were frustrated, and at least five U-boats were sunk. The escorts had been augmented by a score of newly built destroyer escorts and a dozen escort carriers. The carrier planes were sinking U-boats and frustrating their attacks by forcing them to submerge. Allied aircraft patrols also commenced 24-hour daily coverage over the Bay of Biscay. This intensified transit to and from their French bases and decreased the time they could remain at sea. During May, June and July we sank 108 U-boats. The crisis, or turning point, in the "Battle of the Atlantic" had been reached.

A Tenth Fleet and British Anti-U-boat Division analysis of methods in the summer of 1943 resulted in increasing the size of convoys from 40 or 50 ships to about 90 vessels without increasing the number of escorts because their effectiveness was increasing. Plane-ship coördination attacks also were improving. Towed "foxers," or underwater noise makers, attracted acoustic homing torpedoes away from ship's propellers. Faster-sinking, stern-dropped 300-pound depth charges reduced critical seconds of sinking time during which U-boats took evasive action. "Hedgehogs" and "Mousetraps," mounted on the forecastles of escort ships further reduced blind time by projecting a pattern of 30-pound charges several hundred feet ahead which upon striking the water covered a large circular area and exploded only upon contacting the U-boat.

The accumulated instruments which appended the sonar had been incorporated into the "console sonar" which contained new features. They included devices for detection of mine fields, calculation of U-boat depths with the echo-sounder, indication of oncoming torpedoes traveling as fast as 40 miles per hour, and accessories which indicated to accurate ranges, bearings and time to fire weapons. Unescorted fast ships were being fitted with hydrophone torpedo detectors. One merchantman detected an oncoming torpedo, avoided it by turning the ship, then rammed and sank the U-boat.

Only 598 Allied ships were sunk in 1943, while 219 U-boats, 22 Italian and 22 Japanese submarines were sunk, an average of 22 a month. During the winter of 1943-44, the average of 60 U-boats at sea took extreme care to avoid detection and operated mostly submerged, but detection by asdic-sonar was becoming increasingly effective, and we began sinking more U-boats than they sank ships. By April, 1944, the Battle of the Atlantic had been decisively won. Our scientists had shouldered detection problems as their contribution to the enormous Navy effort.

When the Allies invaded the Normandy beaches on June 6, 1944, the invasion waves were led by small naval scout craft equipped with an echo-ranging asdic whose recorder traced the outlines of the beaches. Mines, fencing and other obstacles were detected and blasted from the path of landing craft. The invasion forces were blanketed by heavy air coverage and a sonar screen so tight that no ships were lost to submarines until the end of June when the seven ships they sank cost them 21 U-boats.

Up to this stage of the war the U-boat had acted as a submersible torpedo boat, spending much time surfaced where it was visible by eye and radar and audible to radio interception and radio direction finders. Nazi submarine tactics, however, were revolutionized in the summer of 1944 when U-boats were equipped with the Schnorchel extension stack, which expelled diesel exhaust and drew in fresh air. The Schnorchel stack was about the same height as the periscope, and permitted operation on batteries at periscope depth which previously required complete surfacing, and six-knot speeds at submerged periscope depth instead of about three-knot speeds formerly employed to conserve batteries. The U-boats took up stalking positions at focal points of convoy routes, from where they attacked by blindly firing acoustic and looping torpedoes into passing convoys. Periodically they came to Schnorchel depth to replenish air and re-charge batteries. Admiral Doenitz said, "The strain on crews who remained submerged as long as 70 days was surprising light."

The top of the Schnorchel stack contained an intake-exhaust valve which measured about one and one-half by three feet. This valve and the periscope were the only usual exposures above water while the U-boat operated at Schnorchel depth. The valve was covered with anti-radar material to make it practically invisible to radar. Visual detection range on the Schnorchel was only about a mile or two in daytime and practically nil at night. The U-boats also literally maintained radio silence to deprive the Allies of radio direction finder detection. The Schnorchel had effectively neutralized our antisubmarine air offensive and defeated our surface detection. But—whether Schnorchelling, submerged or bottomed—the asdic-sonar teams continued to detect and locate the U-boats.

During the winter of 1944-45 an average of 40 "continually submerged" U-boats and scores of submersible midget submarines were concentrated in the English Channel area against the bridge of ships carrying re-enforcements to hard-pressed Allied land forces fighting the Battle of the Bulge. Their operations during the last four months of the European war resulted in the sinking of only 56 ships while 88 U-boats and about 100 midget submarines were sunk. The submerged Nazis had been swept out by "Killer Group" escort ships equipped with asdic-sonar, which the Allies had developed to the stage where crevices and rocks of the ocean bottom no longer afforded safe hiding for U-boats.

About 50 U-boats which were operating in the Atlantic surrendered after VE Day and several score more were taken in ports. The Battle of the Atlantic had its finale when some 110 U-boats were carried out to sea and sunk in deep water.

The Japanese at this time had about 70 ocean-going submarines which they primarily employed to supply hard-pressed bases. Their speed of 22 knots surfaced and eight knots submerged compared favorably with submarines of other nations. They were pursued relentlessly by Allied antisubmarine groups and by our own submarines. During 1945, 26 Japanese submarines were sunk; only one Allied ship was lost to submarines between VE and VJ Days. Forty-three Japanese submarines were taken after VJ Day; others were scuttled.

The 72 months of war cost the Allies 4,773 merchant ships representing 21,141,000 gross tons of shipping sunk by enemy action. A total of 996 Axis submarines were sunk, and 221 large and scores of midget submarines were captured after enemy capitulations. The British received credit for sinking 70 per cent of the enemy submarines and the United States credit for 30 per cent.

In the last days of the war the Germans developed their submersibles into true submarines, which, according to Gross Admiral Doenitz, "with its great range of 22,000 miles was capable of scouring all waters of importance for the U-boat war without having to surface." The German designers claimed outstandingly submerged speeds of 24 knots. Allied opinion is that, "it can outdistance and probably shake off any of our present escorts who attack it." Such submarines, plus homing torpedoes, may be with us for the rest of history. They can be built in secret, and are certain to be used by the smaller naval powers.

We barely won a war against the submarines. The enemy attributed our victory to "superiority in the field of science." For the future, Secretary of the Navy James Forrestal has warned "that a military research program literally may be the price of survival."

* * * *

ALL-AMERICAN TEAM

General Jacob L. Devers, Commanding General of the Army Ground Forces, made the following statement in one of his speeches given before an American Legion convention in Washington, D. C. recently:

"Out of another recent conference, at the Armored School at Fort Knox, Kentucky, came a decision to combine the Armored Force and the Cavalry, and that arm of the Ground Forces will henceforth be known as the Armored Cavalry. That gives us a triangular ground force team—Infantry, Armored Cavalry and Artillery—an All-American line-up."

* * * *

CARDED

U. S. CONSTA

by Major General Ernest N. Harmon[★]

Established to insure the success of the American occupation in Germany, the United States Zone Constabulary is a special force employed to provide adequate support for police, government, and intelligence agencies in the United States occupation area.

THE United States Zone Constabulary was organized for the specific purpose of insuring the success of our occupation of Germany. It is an "occupational force of lightly armored, heavily armed, mobile troops, that will be employed as an immediate instrument of law enforcement, in support of civil power, to quell effectively civil disorder, or to provide a covering force to meet and engage a hostile armed force pending concentration of the major elements of the Tactical Force."

Not the first specialized force in our military history, certainly—The Mounted Rifles, The Philippine Scouts, The Alaska Scouts are, to name but a few, earlier examples—nevertheless, the Zone Constabulary is one of our most ambitious undertakings. This complex corps-size organization has been formed in less than six months from a heterogenous collection of armored division combat commands, cavalry groups and squadrons, armored infantry and field artillery battalions, tank and antiaircraft battalions. Other than VI Corps and Headquarters, 4th Armored Division, there were no staffs of higher than group echelon. The entire force had to be integrated, equipped according to Constabulary TO/E, and trained, not only as soldiers but as soldier-policemen—as Constabulary troopers. As this is written on June 1, 1946 "on the job" training has begun; troopers are actually practicing the duties for which they have been trained, and the first of July will see Zone Constabulary fully operational.

While the area of the United States Zone may not seem large by American standards (44,248 square miles, or a bit smaller than Pennsylvania), the population exceeds 14,500,000 and is being augmented almost daily by refugees from former German held territory.

Horses play a part in the U.S. Constabulary in Germany. A horse platoon is seen in action in the photograph below. Animals are used in areas that are impassable for vehicles.

Signal Corps Photo

[★] Commanding General, U. S. Zone Constabulary.

BULARY

The existing problem is aggravated by the numerous deportees from Silesia, the Sudeten land, and the so-called New Poland. The Zone is critically short of housing, which always provides an incentive for a population to migrate. The people are frequently hungry, and, of course, subject to the usual moral degeneration which is the aftermath of defeat. Limitations on the German police encourages marauders to some extent, particularly in rural areas. To the normal police problem is added the presence of displaced persons, who are either unable or unwilling to return to their own countries. Often they bear a grudge against the German inhabitants, and among them is included a lawless element. The police problems of our own Army with its own troops are, naturally, ever with us, and the occupation mission of the Army as a whole demands policing of the German population with an emphasis on counter-intelligence. Giving full credit to all the agencies involved, the need for a mobile, alert, highly trained re-enforcing agency is indicated. Constabulary has the mission of fulfilling that need.

Headquarters, United States Zone Constabulary, Major General Ernest N. Harmon, commanding, is at present in Bamberg, Bavaria. The Constabulary is composed of three brigades of three regiments each. Regiments consist of a headquarters troop, composed of a horse platoon, a motorcycle platoon and a communications platoon; a service troop, a light tank troop, and three squadrons, consisting of a headquarters troop, two motorized and three mechanized troops. Mechanized troops are employed on patrolling missions, and motorized troops on supporting or re-enforcing missions. A squadron in Berlin and a regiment (minus) in Austria have been formed, but are not under the command of the United States Zone Constabulary. The regiments are distributed throughout the Zone so as to provide adequate support for police, government, and intelligence agencies. Two squadrons of each regiment are tactically disposed in the regimental area. One squadron, usually barracked near the regimental command post, is in reserve.

The principal enlisted component is AUS, but the aim is a Regular Army Constabulary-volunteer force. Constabulary service demands a high-type, alert, intelligent soldier, capable of acting on his own initiative but at the same time sufficiently well-disciplined to be reliable when acting on his own. He must be level-headed and physically impressive—a scatterbrain or a physical joke might make all the difference in the world in controlling a riotous mob.

"Troopers do not wear a different uniform, but a distinctive one. The highly-lustered OD helmet liner is banded in yellow-blue-yellow, the bands broken in the front by the Constabulary patch, which is a blue-bordered yellow circle containing a blue "C" pierced by a red lightning bolt. For special ceremonies, Russet leather Sam Browne belt, magazine pockets, first-aid packet and holster (each trooper carries a .45 automatic) are worn on duty. Trousers matching the blouse are worn with paratrooper boots, and a white pistol lanyard completes the dress for the trooper on duty.

Constabulary is not intended as a replacement for existing law enforcement agencies, either American or German. Rather, it is intended as a patrolling force, supplementing present agencies when necessary, and providing them with a ready reserve.

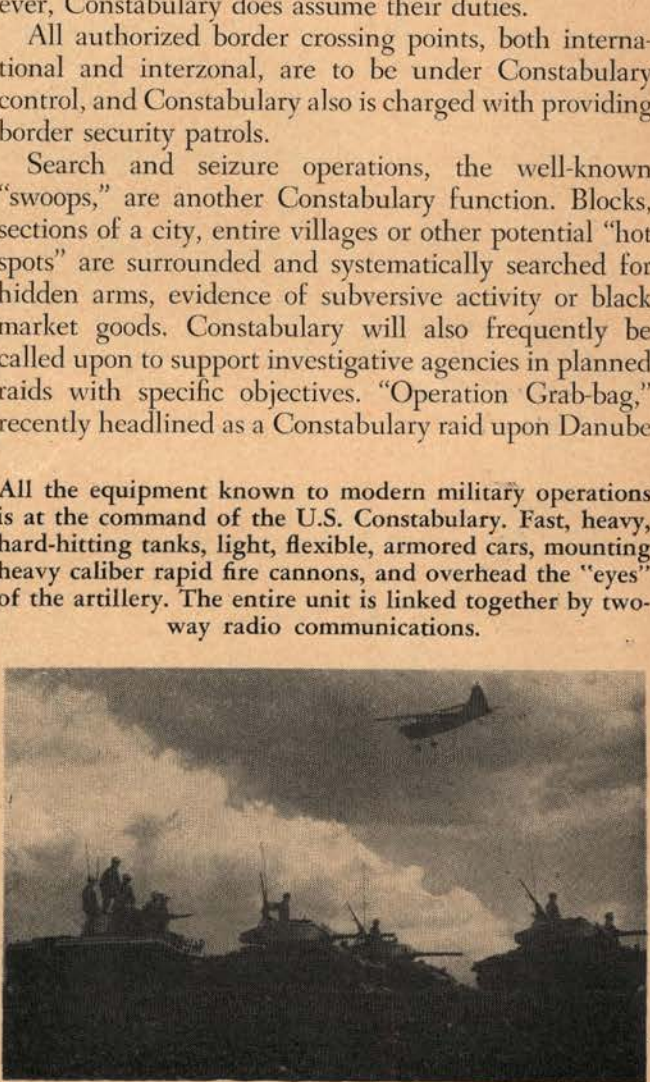
Constant patrols, operating on irregular schedules visit every village in the Zone at least once every 72 hours, and key localities are occupied. The occupation of key localities, however, does not mean that the Constabulary abandons mobility at those stations. Reception of an alarm at any time, day or night, will bring a hive of troopers in peeps, trucks, motorcycles or armored cars. The Troopers motto, "Mobility, Vigilance and Justice," is not meant as an idle catch-phrase.

One of the principal agencies which Constabulary is required to supplement is the Military Police. Where MPs are present the Constabulary does not function unless called upon; when MPs are not available, however, Constabulary does assume their duties.

All authorized border crossing points, both international and interzonal, are to be under Constabulary control, and Constabulary also is charged with providing border security patrols.

Search and seizure operations, the well-known "swoops," are another Constabulary function. Blocks, sections of a city, entire villages or other potential "hot spots" are surrounded and systematically searched for hidden arms, evidence of subversive activity or black market goods. Constabulary will also frequently be called upon to support investigative agencies in planned raids with specific objectives. "Operation Grab-bag," recently headlined as a Constabulary raid upon Danube

All the equipment known to modern military operations is at the command of the U.S. Constabulary. Fast, heavy, hard-hitting tanks, light, flexible, armored cars, mounting heavy caliber rapid fire cannons, and overhead the "eyes" of the artillery. The entire unit is linked together by two-way radio communications.



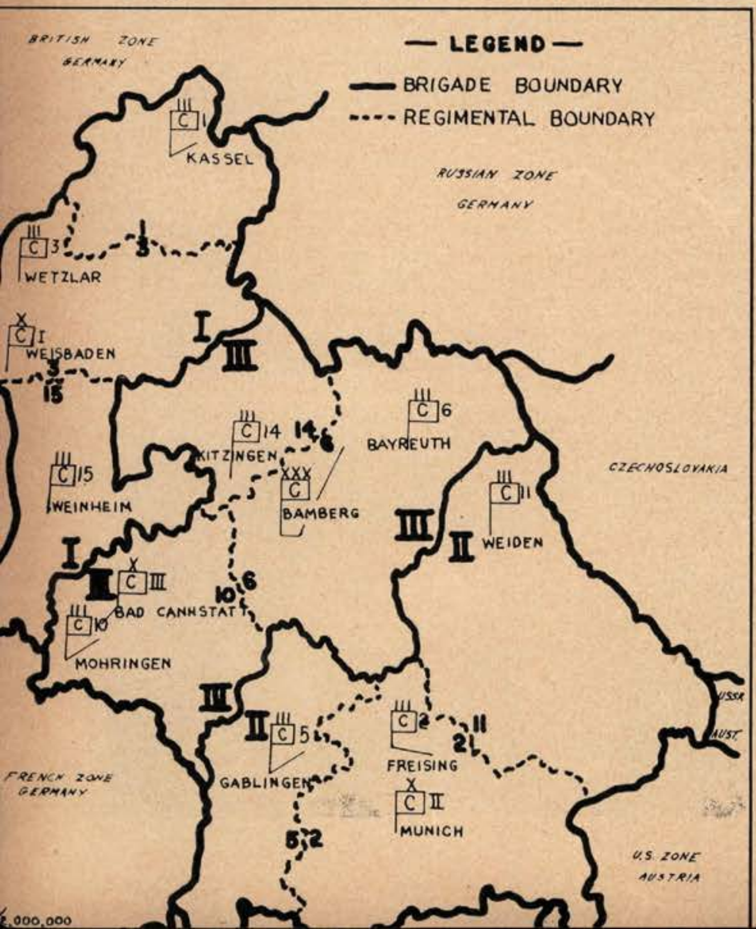
Signal Corps Photo

River shipping, was actually of the latter type. Although Constabulary had not become operational at the time of the raid, five squadrons, supporting the Regional CIC, were employed in sealing off and guarding ships on the Danube.

The German police, fairly recently reorganized, are hampered by shortages of equipment, transportation and personnel. Policemen are often inexperienced, and training facilities are limited. The prestige among their own people which the German police system once enjoyed was lost after the war for a number of reasons. Some of these reasons probably were the dissolution of the old police system immediately after occupation, the inability of the new Military Government police to implement their orders (they have only recently been armed), and a general breakdown of respect for German authority. All these factors cause a purely German police problem. Powerless to act against Allied nationals, the German police are occasionally disarmed and beaten by rowdy elements found in any Army or nation.

While members of the Constabulary on duty may assist the German police in efforts to arrest or to quell disturbances among the civil population, they do not normally interfere unless it is apparent that the police are unable to handle the situation. In the event of a breach of the peace by Allied or displaced persons, the individual German policeman is authorized to request Constabulary intervention. In most other cases, however —except in an emergency—requests for Constabulary assistance are made through Military Government channels.

Regimental and Brigade Areas, U.S. Constabulary.



Signal Corps Photo

Constabulary school graduates in Sonthofen, Germany, stage a demonstration for their commanding general, just after the completion of the intensive four weeks training course.

Very obviously, the mission of the Constabulary demands a type of training not normal to the average soldier. A glance at the curriculum of the Constabulary School at Sonthofen in Bavaria, illustrates the diversity of subject matter. Not too far from the beaten path of normal military schooling are subjects including tactical training, covering offensive and defensive combat, urban, rural and frontier patrolling, and riot duty, weapons, communications, maintenance, and mechanized tactics. However, other subjects are far different, and comprise police operations—including support and re-enforcement of existing American and German agencies, technique of arrest, rules of evidence, traffic control, law, orientation on CIC, CID, the military police —and Geopolitics, which includes the study of German history, geography, and legal structures as well as Military Government and Allied occupational forces.

Since the first class finished late in March of this year, graduates of the Constabulary School have offered invaluable assistance in training the units with which they have been posted. Much of the training task, however, has fallen upon heretofore unspecialized officers and men who have learned the hard way. Cadre training was conducted during March despite the formidable obstacles of unit movements, instructor shortages, lack of manuals and training aids, and the turning-in and drawing of equipment. Certain units were obliged to continue with occupation missions at the same time.

Beginning in April and through May, training continued in basic military subjects, with the addition of specialists subjects and topics peculiar to Constabulary. During this period for example, the Regimental horse platoons and motorcycle platoons acquired facility in the use of their mounts. Beginning in June, the Constabulary becomes operative in what amounts to a one-month shakedown "cruise," and present plans call for it to become completely operational by July.

CARDED

The 86th Cavalry Reconnaissance Squadron

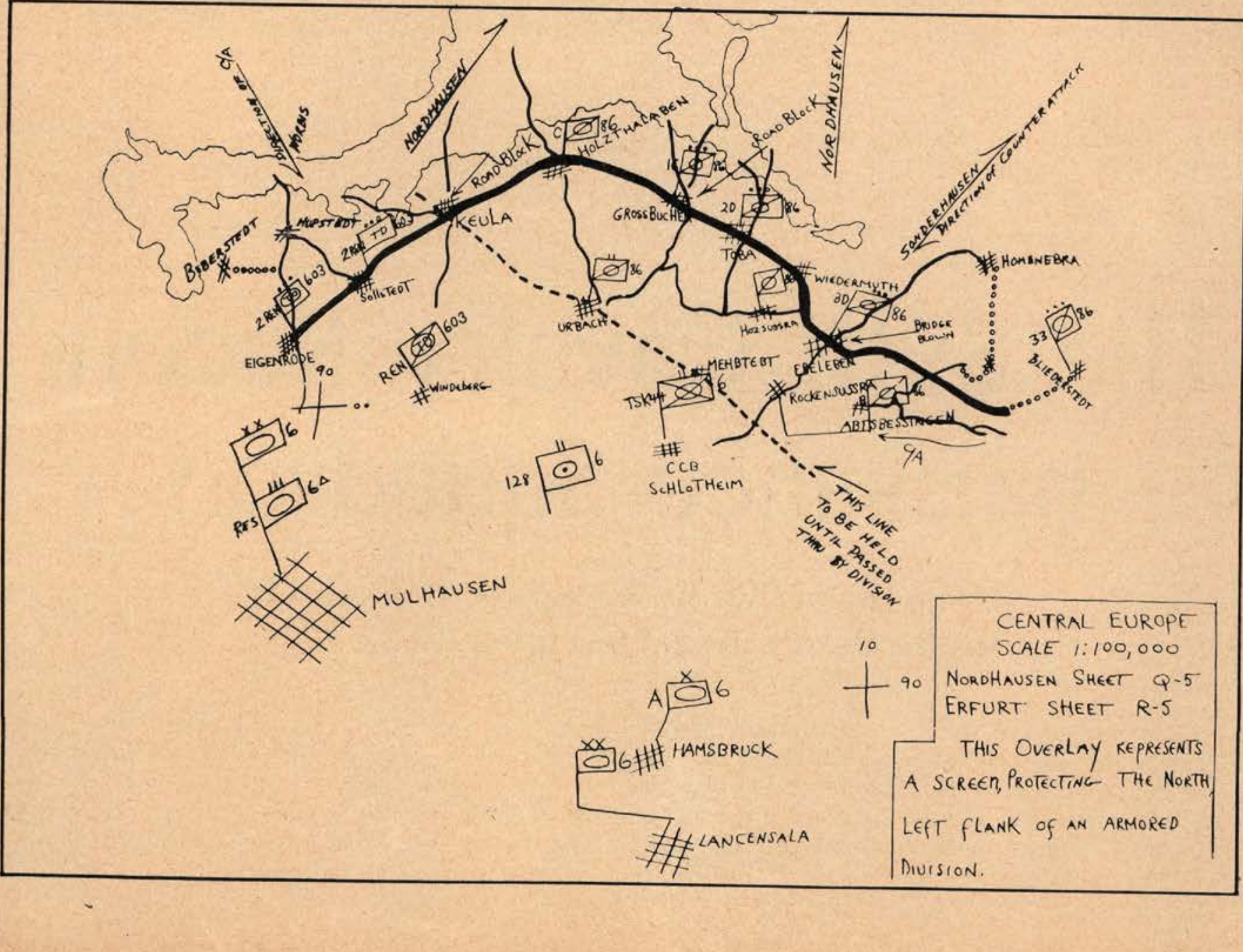
Screening of the 6th Armored Division near Muhlhausen, April 5-12, 1945.

by Lieutenant Colonel Harry C. Brindle[*]

CONCLUSION

ON April 4, 1945, the 86th Mechanized Cavalry Reconnaissance Squadron, less Troop B, of the 6th Armored Division was given the mission of screening along a line northeast of Muhlhausen (WH9093).[**] The screen was to extend from Hohenebra (RD1405) through Gross Breuchter (RD0307) and Keula (RC 9407) to Huepstedt (RC8806). At this time, two combat commands of the 6th Armored Division were in assembly areas in the vicinity of Schlotheim (0498) and Lancensalza (WJ0382), while the third combat command had been committed to the northwest to wipe out an enemy pocket. The First Army had not yet come up abreast of the Third Army. The screening position was on the extreme left flank of the Third Army.

The squadron commander divided his security line into three sectors, and to each sector he assigned a mechanized cavalry reconnaissance troop, reinforced by one platoon of light tanks and one platoon of assault guns.


DIRECTION OF C/A
WORBIS
NORDHAUSEN
ROAD BLOCK
C
86
HOLZTHALEBEN
ROAD BLOCK
NORDHAUSEN
16
86
SONDERHAUSEN
DIRECTION OF COUNTERATTACK
HUPSTEDT
TD
603
2RCN
KEULA
GROSS BUCHER
20
86
BIBERSTEDT
603
2RCN
SOLLSTEDT
86
TOBA
WIEDERMUTH
HOHENEBRA
3D
86
EIGENRODE
90
REN
TD
603
WINDEBERG
URBACH
HOLZSUSSRA
BRIDGE BLOWN
33
86
MEHRSTEDT
6
TSK
EBELEBEN
ROCKENSUSSRA
B
ABTSBESSINGEN
BLIEDERSTEDT
XX
6
9A
CCB
SCHLOTHEIM
RES
III
6A
128
II
6
THIS LINE TO BE HELD UNTIL PASSED THRU BY DIVISION
MULHAUSEN
10
90
A
X
6
XX
6
HAMSBRUCK
LANCENSALA

CENTRAL EUROPE
SCALE 1:100,000
NORDHAUSEN SHEET Q-5
ERFURT SHEET R-5

THIS OVERLAY REPRESENTS A SCREEN, PROTECTING THE NORTH LEFT FLANK OF AN ARMORED DIVISION.

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[*] Commanding 86th Mechanized Cavalry Reconnaissance Squadron.

[**] Maps: Central Europe 1:100,000, Sheets Q-5—Nordhausen, and R-5, Erfurt.

The three troops moved out at 0700 hours April 5 from Struth, in the vicinity of Muhlhausen. One troop advanced on Keula, one on Gross Breuchter, and one on Ebeleben (RD0802). The squadron, less the three reinforced troops and Troop B which had previously been attached to CCB, followed the route of the troop marching on Gross Breuchter.

Enemy resistance during the movement was light, consisting mostly of small-arms fire. All towns were cleared by 2000 hours with a minimum loss to the squadron. The squadron command post was located at Urbach (RC9903). By 1000 hours on April 6, roadblocks had been established on all main routes leading south toward Muhlhausen, Erfurt (WJ3270) and Weimar (WJ5271), and patrols were operating over unimproved roads between these main roads. Late on April 6, the squadron was reinforced by Troop B, reverting from CCB, plus the reconnaissance company of the 603d TD Battalion. Troop B was committed to reinforce and extend the screen to the east with the troop CP at Abtsbessingen (RD1100). The troop was ordered to send patrols to the east to Bliederstedt (1801) and to Hohenebra (1405). A counterattack was anticipated from the direction of Clingen-Greussen (2397). The reconnaissance company of the 603d TD Battalion was committed on the northwest flank with the company CP at Eigenrode to detect the presence or build-up of enemy troops in that area. The division previously had been hit by a counterattack from that direction.

During the ensuing week, the screen was constantly prodded by the enemy seeking to go south out of Nordhausen (RD1227), in the direction of Erfurt and Weimar. Several concentrated attacks were made by the enemy, but all were successfully repulsed, although not without loss to the squadron. This screen was maintained until contact was established with elements of the First Army at 1630 hours on April 12, 1945, in the vicinity of Nordhausen. It was later learned that as a result of the establishment and maintenance of this screen, the enemy was forced to move east rather than south, as had been his original intention.

This action reveals one method of setting up a protective screen with mechanized cavalry to secure a flank of an armored penetration. The planning provided for an alternate security line to the rear where the troops could be ordered to fall back (see sketch). However, the alternate line was ordered held until reinforced by other division units. The troops thoroughly understood the plan and made preparations to carry it out in case of a serious counterattack. The squadron CP was placed in the center of the screen and well forward behind the screen. This action illustrates the flexibility of mechanized cavalry units, and their capability to absorb counterattacks. Over the eight-day period, four counterattacks hit the screen at different places, but while the screen was badly bent several times, it was never penetrated and the original line was reëstablished.

* * * *

CARDED

The 89th Cavalry Reconnaissance Squadron

Delaying action by Troops A, B, C and E in the Befort area, December 16-25, 1944.

AT the outbreak of the German counteroffensive, December 16, 1944, the 89th Cavalry Reconnaissance Squadron was in the vicinity of Bissen. The squadron commander was ordered to move Troops A, B, C and E without delay to the Haller-Christnach area, where they were to be attached to Combat Command A, whose mission was to defend the Befort area.

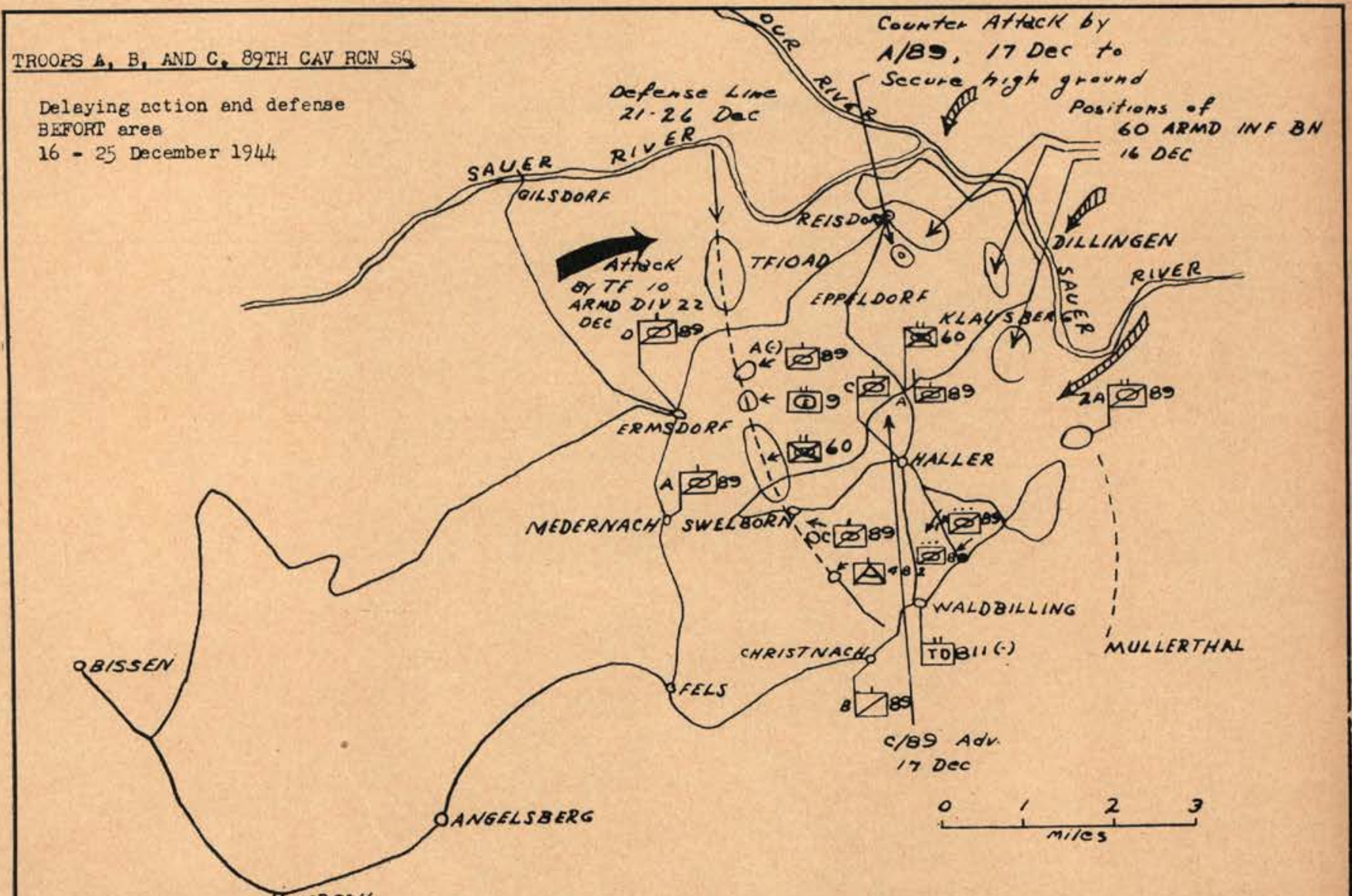
Upon arrival at Haller, Troop A was attached to the 60th Armored Infantry Battalion, and outposted Befort; Troop B outposted Waldbillig and Christnach. During the night of December 16-17, the enemy infiltrated into the lines of the 60th Armored Infantry Battalion, and at 1000 hours December 17, Troop A counterattacked the position and drove the enemy from the high ground north of Befort. At 1930 hours, the commanding officer of Troop A received orders to hold Befort as long as possible, and to cover the withdrawal of the 60th Armored Infantry Battalion during the night of December 17-18 to the positions shown on the sketch, northeast of Ermsdorf. Under continuous heavy pressure from the enemy, Troop A completed its withdrawal to Waldbillig by 1400 hours, December 18.

Meanwhile, Troop B continued outposting Christnach and Waldbillig. It received orders to move toward Mullerthal at 1000 hours, December 17, and at 1230 hours was ordered to attack the town. Reinforced by four tank destroyers, Troop B attacked at 1330 hours and encountered determined enemy resistance which stopped its advance. Troop B then was ordered to withdraw, and to organize defensive positions on the high ground covering the approaches to Waldbillig.

Troop C arrived at Haller at 0730 hours, December 17. It attacked dismounted northwest toward Befort at 0800 hours, December 17, with one platoon of Battery B, 482d AAA Battalion, in support. The troop advanced to the line shown on the sketch, but continuing enemy pressure forced it to withdraw to the vicinity of Haller. At 0230 hours, December 18, Troop C moved to Sawelborn to defend the high ground along the north-south road in that area.

At 0400 hours, December 18, the troop organized its defensive position, using three platoons in line. Battery A, 482d AAA Battalion, covered the area on the south flank of Troop C. Troop A remained in Waldbillig until 1530 hours, December 18, when it was ordered to move to Medernach immediately. Here it received the mission of establishing active patrols in the vicinity of Ermsdorf, Eppeldorf and Gilsdorf. Troops B and C maintained their defensive positions, and Troop A continued its patrolling through December 21.

On December 21, a task force of the 10th Armored Division attacked and secured positions west of Eppeldorf, as shown on the sketch. Troop A was ordered on December 22 to maintain active patrolling between the task force of the 10th Armored Division and the strongpoints that had been established to the south (see sketch). All troops continued in these positions until December 26, when Troops A, B and C were withdrawn to a rest area.


TROOPS A, B, AND C, 89TH CAV RCN SQ
Delaying action and defense
BEFORT area
16 - 25 December 1944
Defense Line
21-26 Dec
Counter Attack by
A/89, 17 Dec to
Secure high ground
Positions of
60 ARMD INF BN
16 DEC
OUR RIVER
SAUER RIVER
SAUER
RIVER
GILSDORF
REISDORF
DILLINGEN
Attack
BY TF 10
ARMD DIV 22
DEC
TF10AD
EPPELDORF
KLAUSBERGER
D 89
A(-) 89
9
C
A
89
60
2A 89
ERMSDORF
HALLER
A 89
MEDERNACH
SWELBORN
C 89
89
482
WALDBILLING
CHRISTNACH
TD 811 (-)
MULLERTHAL
BISSEN
FELS
B 89
C/89 Adv.
17 Dec
ANGELSBERG
MERSCH
0 1 2 3
miles

CARDED

The 92d Reconnaissance Squadron

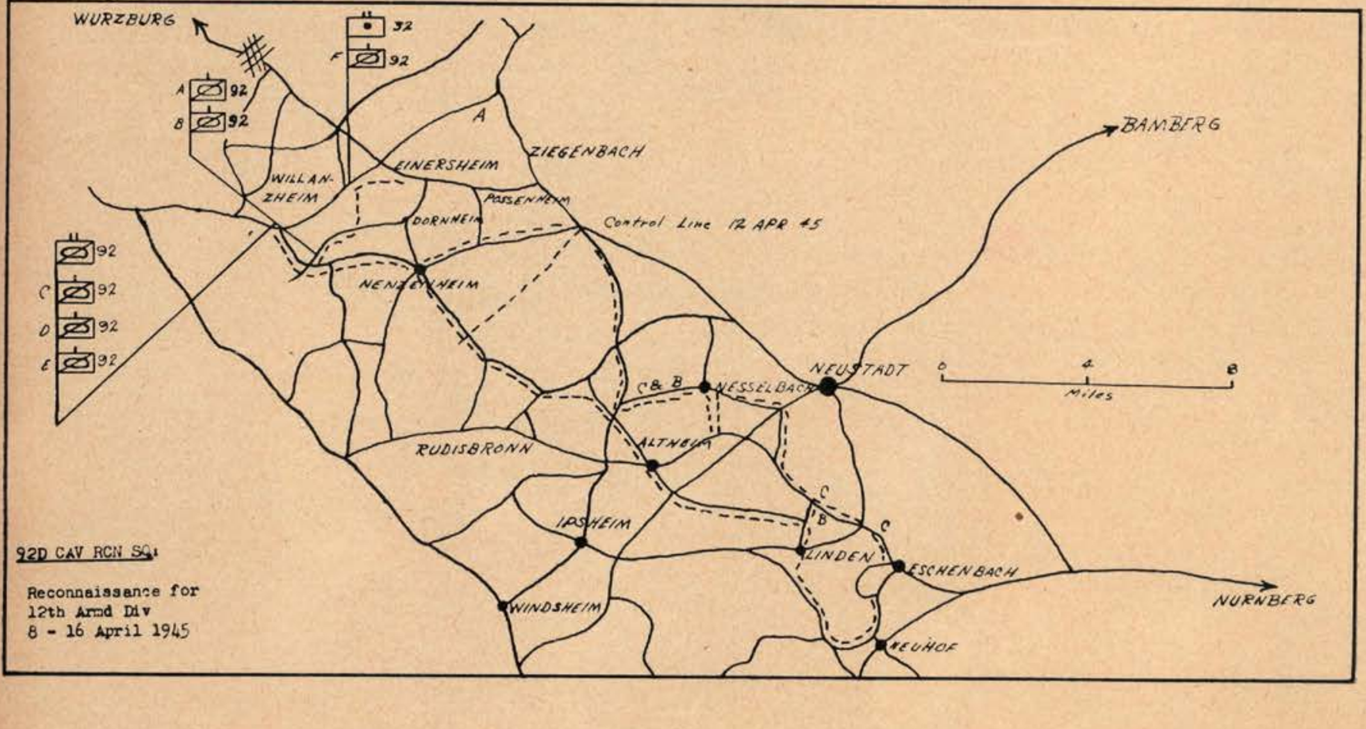
Reconnaissance for the 12th Armored Division in the Neustadt area, April 8-12, 1945.

ON April 8, 1945, the 92d Cavalry Reconnaissance Squadron, then generally south of Wurzburg, initiated reconnaissance from its assembly position east toward Neustadt. Two platoons of medium tanks were attached to the squadron, and one section, each, was attached to Troops A, B, C and D. One light tank platoon, each, of Company F, was attached to Troops A, C and D. The 342d Armored Field Artillery Battalion was attached to the squadron. The division mission was to continue the attack to the southeast.

At 1200 hours April 8, the squadron advanced, Troops A, C and D moving as indicated on the sketch. Troop B was in squadron reserve and Troop E, and the 342d Armored Field Artillery, initially at Willanzheim, were prepared to give supporting fire. At first the troops advanced against light resistance, but by 1800 hours had encountered a strong enemy line running generally from Possenheim-Dornheim-Nenzeheim. At dark, Troops A, C and D were all in enemy contact just west of this line.

On April 9, the Squadron observed and probed the enemy's positions to determine his strength and dispositions. On April 10, the Squadron received orders to continue its frontal pressure on hostile positions in conjunction with an attack of Combat Command B on the north, and to be prepared to pass through the gaps developed by this attack. On April 11, Troop A made contact with Task Force Norton of Combat Command B at Zeigenbach. The Squadron maintained its pressure on hostile positions through April 12, and that afternoon the troops were able to advance. However, prior to darkness all troops met heavy enemy small-arms and bazooka fire, and a line of contact was established, as shown on sketch. The Squadron also kept contact with Combat Command B on the north and the 116th Cavalry Reconnaissance Squadron on the south.

On April 13, the troops advanced again, and by dark Troop C was in contact with the enemy at Altheim, Troop D at Ipsheim, and Troop B at Ober Nesselbach. The remainder of the squadron moved on to Rudisbronn. Because of the road net, the advance was made on only two roads, Troop C being followed by Troop B, and Troop D by Troop A. On April 14, the squadron prepared to continue its advance to the east.


WURZBURG
32
F 92
A 92
B 92
A
ZIEGENBACH
EINERSHEIM
WILLANZHEIM
POSSENHEIM
DORNHEIM
Control Line 12 APR 45
92
C 92
D 92
E 92
NENZENHEIM
BAMBERG
NEUSTADT
0
4
8
Miles
C & B
NESSELBACH
ALTHEIM
RUDISBRONN
C
B
C
IPSHEIM
LINDEN
ESCHENBACH
WINDSHEIM
NURNBERG
NEUHOF
92D CAV RCN SQ.
Reconnaissance for
12th Armd Div
8 - 16 April 1945

On April 15, Troop D, followed by Troop A, moved out on the route shown, encountering light opposition. By night, April 15, Troop D had penetrated the enemy position to Neu Selingsback, and the Squadron command post had moved to Linden. In the meantime, Troop A advanced against Neuhof, and by 1700 hours, April 16, had secured the town, in conjunction with Troop C, which moved in from the north. Meanwhile, Troop D remained in position at Neu Selingsback.

The Squadron had thus accomplished its mission of reconnaissance in force to the southeast, and had pushed against stiffening enemy resistance a distance of 30 miles.

* * *

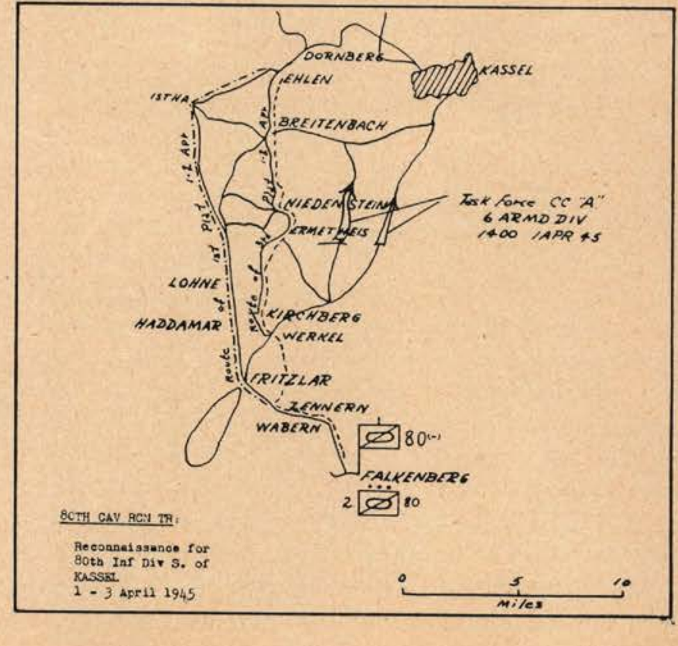
CARDED

The 80th Cavalry Reconnaissance Troop

Reconnaissance during advance of the 80th Infantry Division to Kassel, April 1-3, 1945.

AT 1400 hours on April 1, 1945, the two task forces of Combat Command A, of the 6th Armored Division, which were en route to seize Kassel, were halted six miles south of the town by corps order. The mission had been changed. By 1700 hours, the 318th Regimental Combat Team, of the 80th Infantry Division, passed through and relieved the combat command of the 6th Armored Division in its zone. The 80th Infantry Division was disposed with regimental combat teams abreast from east to west in the following order: 319th, 318th and 317th. The 9th Armored Division, under the First Army, was operating in the zone to the west of the 80th Division.

On the morning of April 1, the 80th Cavalry Reconnaissance Troop, of the 80th Division, assembled in the vicinity of Falkenberg and was assigned the mission of reconnoitering in the division zone, and of maintaining contact with elements of the First Army on the division's left flank. In executing the mission, the 1st Platoon reached Fritzlar, where it made contact with the 27th Armored Infantry Battalion of the 9th Armored Division, the 102d Cavalry Group, and the 2d Ranger Battalion—all elements of the First Army. The Platoon proceeded through Haddamar, Lohne, Merzhausen, and then went northeast to Niedenstein. In the meantime, the 3d Platoon followed the task force of the 6th Armored Division via Wahern, Zennern, Werkel, Wehren, Kirchburg, and Eermheis. No opposition was met by either platoon, but 15 POWs were taken during


DORNBERG
KASSEL
EHLEN
ISTHA
BREITENBACH
NIEDENSTEIN
ERMETHEIS
Task Force CC "A"
6 ARMD DIV
1400 1APR 45
LOHNE
HADDAMAR
KIRCHBERG
WERKEL
FRITZLAR
ZENNERN
WABERN
80
FALKENBERG
2 80
Route of 1st Plat 1-2 Apr
80TH CAV RCN TR:
Reconnaissance for 80th Inf Div S. of KASSEL
1 - 3 April 1945
0
5
10
Miles

the day. The 2d Platoon remained in troop reserve.

On April 2, the division met stiffening resistance on the outskirts of Kassel. This increased resistance was felt by the 1st and 3d Platoons as they continued north, and sporadic antitank and small-arms fire was received en route. However, the 1st Platoon reached Isttra and the 3d Platoon reached Breitenbach without difficulty. During this operation 15 POWs were captured, and two enemy trucks and two 88mm. guns destroyed. Contact was maintained with the 2d Ranger Battalion and the 102d Cavalry Group, and also was established with the 273d Infantry Regiment of the 69th Division. On April 3, the 80th Cavalry Reconnaissance Troop reconnoitered the zone of advance of the 317th Regimental Combat Team to Ehlen. Later that day, the Troop was relieved by the 3d Cavalry Reconnaissance Squadron (Mecz.) and was attached to the 319th Regimental Combat Team. The troop was then given the mission of reconnoitering the division's right flank south of Kassel.

This operation illustrates a typical assignment for a cavalry reconnaissance troop of an infantry division-reconnaissance, with security also provided. Enemy resistance was light and scattered, but was about the maximum which could be successfully engaged while maintaining the required speed.

* * * *

CARDED

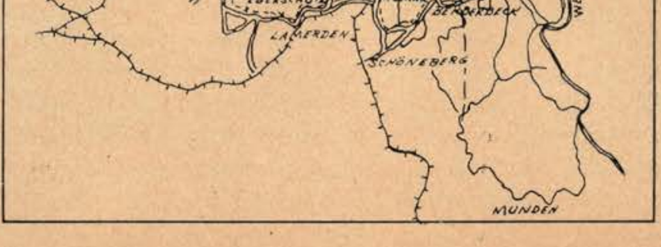
The 104th Cavalry Reconnaissance Troop

Attack from Borgentreich area to Weser River in advance of the 104th Infantry Division, April 7, 1945.

ON April 4, 1945, the 104th Cavalry Reconnaissance Troop (Mecz.), of the 104th Infantry Division, with a platoon of infantry and the assault gun platoon of the 750th Tank Battalion attached, moved from Padberg, Germany, to Hottheim. On April 5 and 6, this force, known as "Task Force Laundon," moved through Blankenrode and Borgentreich, protecting the division's left flank.

On April 7, 1945, Task Force Laundon, preceding the 413th and 415th Regimental Combat Teams, captured the towns of Lamerden, Eberschutz and Humme. At Humme, the force divided, with one platoon moving along Route 2 and capturing Schoneberg and Ederschutz. The 2d Platoon moved north from Humme and captured Stammen, then proceeded along Route 1 and captured Friedrichsfeld, and turned north again on Corn Phase Line and captured Gottsburen. The 1st Platoon moved along Route 1 and at 1505 hours reached the west end of Gieselwerder where it found the bridge over the Weser River had been blown. By 1700 hours, the final objective on the Weser River had been reached by all platoons. On the following day, the troop began a new mission of protecting the division left flank.

This operation demonstrated the ability of a mechanized cavalry reconnaissance troop, fighting on a lightly defended front, to operate with speed in advance of regimental combat teams, capturing successive key positions and making it possible for the bulk of a division to advance without loss of time.



CARDED

36th Squadron in the ETO

Reconnaissance Platoon in Front of Infantry Division

by Lieutenant Allen L. Zediker*

ON April 11, 1945, Troop B was relieved of the mission of flank security for the XIII Corps and attached to the 102d Infantry Division to perform reconnaissance in the division zone.

The 3d Platoon was given the right half of the division zone in advance of the 405th Infantry Regiment, mounted in trucks. Our mission was purely reconnaissance and we were not restricted to our zones if we found it necessary to move out of them to by-pass a strong point.

Our instructions were to report any enemy encountered or observed, and to report on phase lines one, two and three. When we reached phase line A we were to hold up and await further instructions.

The importance of phase lines in an operation of this type cannot be overemphasized. Even with the long-range radios which we have, it is the only sure means of control which higher headquarters have over their reconnaissance elements.

Until we reached phase line two we reconnoitered the zone quite thoroughly without meeting any resistance. We then received orders from the troop commander to push reconnaissance along a route through phase line A, phase lines 4 and 5, and hold up on phase line B. We reached phase line B at 1800, having encountered only a few straggling Wehrmacht and volkstrum troops. They surrendered readily, and were sent to the rear without escort.

After reporting our position we were instructed to outpost phase line B and await the arrival of the infantry, which, because of our 50-mile advance, was allowed to reach B plus attachments without dismounting any troops.

At 0600, April 13, we jumped off in our same zones toward our final destination, phase line C. As we progressed further into enemy territory we encountered numerous rear echelon troops who surrendered readily. By 1300 we had amassed a total of 250 prisoners. It was decided to send an escort of one machine-gun bantam and evacuate them to the troop CP 10 miles to the rear.

We continued on our mission, reaching phase line 7 without further difficulties. After crossing this point we encountered elements of a German paratroop regiment firmly entrenched in a heavily wooded area. Forced to fight our way out of the situation, we lost one man, killed three Germans, and captured 6.

After reporting the disposition and location of the enemy, we were instructed to by-pass and continue on our mission. While attempting to by-pass into the left platoon zone we liberated 500 American PW's with a 40-man German guard. After arming the Americans with available German weapons, and giving them all of our rations, we continued on our mission.

It was believed that the platoon in the left zone had encountered elements of the same paratroop regiment. This was confirmed when we received a message from the troop CO to return to the CP.

Infantry and artillery units were used to clean out the woods.

CONCLUSIONS

The advantage of placing the platoon leader in the turret of the leading armored car is clearly shown in this action. Where the platoon is roadbound, he is able to use and control the maximum fire power in his point vehicles. This position also enables him to control his platoon, and send back information through the two radio sets.

It is important that civilian population in areas occupied be instructed to put out white flags as a signal to the following elements that the territory is in our hands.

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*3d Platoon, Troop B, 36th Cavalry Reconnaissance Squadron (Mecz).

* * *

Tank and Reconnaissance Combat Teams

by 2d Lieutenant Leroy O. White*

A HIGHLY successful combat team made up of one platoon of light M24s and one reconnaissance platoon was used by the 36th Cavalry Reconnaissance Squadron (Mecz). Such a team could accomplish fast and aggressive reconnaissance. Occasionally a section of tank destroyers was attached to it if enemy contact was expected.

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*36th Cavalry Reconnaissance Squadron (Mecz).

This type of combat team was employed the morning of April 3. We had just crossed the Rhine River and moved up to a small town southwest of Munster, which was under attack on three sides. Three platoons were given the mission of making a reconnaissance to the northeast in an attempt to reach the town of Telgte. They were to secure and hold any bridges that were found intact, which would mean dropping off a part of the small task force.

The platoons moved out at 0600 and were to report to the CO by radio every half hour. When our platoon, which was first, reached the next town it was joined by a reconnaissance team. With the assistance of the scout sergeant in charge the following plan was formulated: the point bantam would lead out, followed by the M8 armored car, the tank platoon, and the mortar bantam. The platoon would move forward until it hit something suspicious. If a personal reconnaissance showed 75mm fire from the tanks was warranted, it would be laid, and then the platoon would try to go through. If this was impossible the obstacle would be by-passed.

The platoon moved along between 10 and 15 miles an hour, and by 1130 hours was starting to cross the main road which entered Munster from the north. The CO came up and said that the Jerries had it covered with 88s, and that the 3d Platoon had lost one tank. He advised us to find another way across, and stated that since the Germans were using the east road as an escape route from Munster it must be closed.

The squadron CO then arrived and told us that all the bridges were out across the canal northeast of Munster, but that the British had one across the canal and for the platoon to cross there. We reached the bridge control line at 1430, and after awaiting our turn in a line of troops two miles long, finally crossed at 1730.

The platoon rolled to within a half-mile of Westbevern, which was on the road to be closed. Here it halted to fire at a German soldier who had run into the cover of near-by woods. The company CO dismounted and ran him down for questioning. The prisoner said no German or American soldiers were in the town and identified his unit as an antiaircraft outfit, whose positions could be seen to our left. At this time 4 or 5 German soldiers were seen running for a dugout. The platoon opened fire with both .50 calibers and 75s and scored a hit with a 75 HE in the middle of the group, which eliminated it.

A bantam now was sent forward to the town. It was fired on at the outskirts by a burp gun and the crew dismounted and took cover. Since no antitank weapons were visible in the town, our tanks entered it. When they reached the center of the town, two panzerfausts were fired at them but missed, and the tanks continued to the main road.

They rolled on to the road within 50 yards of a truck full of Germans who were either in the act of mounting or dismounting. Tank machine guns and 75s opened fire. A 75mm hit in the middle of the truck took care of things.

As the tanks started forward, dismounted German soldiers who had approached under cover of a bank, hit the first tank with a panzerfaust. The other tanks immediately opened fire, and kept the enemy down long enough for the crew of the disabled tank to leave it and mount the second tank. Things got pretty hot then so we moved out.

The tanks proceeded to the edge of the town and were deploying to shell it into submission, when the squadron CO arrived. Informed of what had happened, he instructed us to place three tanks on the road leading into town in order to keep our supply lines open, and to take the remainder of the force and try to capture the next town to the north, Lehmbrock. It was on the same road that the Germans were using, and its capture would mean an accomplishment of the mission.

We reached the outskirts of Lehmbrock just after dark, and as we turned the first street corner the lead tank was hit by a panzerfaust. Part of the second tank's crew promptly dismounted to cover the crew that was leaving the disabled tank. The German soldiers who had fired the panzerfaust turned the corner directly in front of us, and were shot. Troopers ran to the tank and found that the crew had escaped. They soon returned to our position and reported that the town was filled with Jerries. We decided to remain on the outskirts and attack early the next morning. Road blocks were posted and security established for the night.

Before morning the rest of the company, Troop A and part of Troop E, arrived. The author returned to pick up the three tanks which had been left at Westbevern. While there, I saw that a large force of Germans was concentrating in the town, and heavy enemy armor moving along the road from Munster. The three tanks had beaten off two counterattacks, and this information was reported to the squadron CO when I returned.

The next morning at 0730 hours Troop A supported by Troop E's assault guns began a dismounted attack on Lehmbrock. The town was cleared by 1030 hours, and 500 PWs, including 135 Hungarian soldiers, were captured, and about 150 enemy were killed. Our casualties were very light.

At 1230 hours, we received orders to move to Telgte, about 6 kilometers away. A reconnaissance team and a section of tank destroyers were attached to the platoon.

We moved out about 1300, and had gone about two miles when the point bantam received fire, which was returned. Seven German soldiers surrendered, and were sent to the rear. We had little trouble the rest of the way to Telgte, and took 89 prisoners en route. At Telgte the town garrison of 29 soldiers surrendered, and were sent to the rear.

We had proceeded about a mile and a half from

Telgte toward Westbevern when we captured an enemy point. The NCO in charge said the point was a part of approximately 250 soldiers of all branches and two Mark V tanks which were moving from Westbevern toward Telgte. This was verified by reconnaissance. We turned back toward Telgte and were going to defend the town, but before we arrived there the CO radioed that Lehmbrock was under attack by a mixed force of tanks and infantry. He believed that we were possibly cut off and instructed us to return quickly. Our force was needed to help repel the attack. We reached Lehmbrock without trouble, put the tanks and TDs into position, and the Jerries were surprised when they started their next attack.

The described plan was used during the move to the Elbe River. At times, a reconnaissance platoon supported by a platoon of light tanks, were employed; at other times, a reconnaissance team was attached to a platoon of light tanks. It was found impracticable to send out a tank platoon unaccompanied by a reconnaissance element. Except for minor incidents this system was efficient. It enabled rapid movement, an effective reduction of minor resistance, and gave excellent protection to the units whose flanks it was protecting.

* * *

Deceptive Action by Reconnaissance Patrols

by Captain Roy L. Huckabee

MAJOR GENERAL GILLEM, commanding the XIII Corps, Ninth Army, visited the CP of the 36th Cavalry Reconnaissance Squadron (Mecz) in Willich, Germany on March 15, 1945, and stated that he had a mission that could only be performed by a cavalry outfit. It was required that aggressive patrols be sent across the Rhine River to make the enemy believe that a crossing would be made by the Ninth Army in the sector Lank-Latum-Mudrich.

At that time the 36th Cavalry Reconnaissance Squadron was performing a security mission, while the 44th Cavalry Reconnaissance Squadron (also of the 11th Cavalry Group) was responsible for the river line sector —Lank-Latum-Mudrich.

The squadron commander immediately called in the three reconnaissance troop commanders and gave them orders to reconnoiter at once for a probable crossing site during daylight hours. Each troop was to send a 7-man patrol across during the hours of darkness with the mission of reconnoitering by stealth over a route that would carry the patrols an average of 3,000 yards east of the river bank. These patrols were to determine: one, if the enemy had mined the waters or east bank of the Rhine; two, if he had constructed any obstacles on the far bank; and three, the location of enemy positions and installations, in preparation for combat patrols to go over on succeeding nights to take prisoners.

In the meantime the S-2 and S-3 called in representatives from the corps engineers and corps supporting artillery to coördinate plans for the patrol operations. The engineers were to furnish an assault boat and 7-man crew for each of the three patrols and an additional boat and crew for any emergency. The artillery was to prepare three separate fire plans to be ready to fire a numbered concentration, if called for by the patrols anywhere along the proposed routes.

Communication was to be maintained by an SCR-300 (Infantry set) with the patrol, one with the boat crew, who would establish a temporary beachhead, one on the near shore with the troop commander, who would have communication with the artillery OP by telephone and SCR-300, and communications to squadron headquarters by telephone and SCR-506.

Patrol plans were prepared early enough for the leaders and key members of the patrol to make a personal reconnaissance in daylight of the route to be covered. Plans were coördinated with units on our right and left, as there was always the possibility of the boats drifting off their proposed route because of the swift current (6-7 mph) and the wide river (450 feet).

Just one of the patrols encountered the enemy the first night and met only small-arms fire. It was evident that the enemy had a very light line and did not use any supporting mortar or artillery fire.

For 6 consecutive nights a minimum of three patrols crossed the river, alternating the routes, time of departure, number of men in patrols and type of boat, but always with the mission of: one, harassing the enemy; two, locating defensive installations; and three, making him conscious of increased patrol activity.

At the end of 6 days the enemy had definitely strengthened his line, as proven by successive patrols, PWs, and suppressed civilians who escaped across the river. In addition to the small-arms fire received the first night, the enemy fired 20mm, 60mm, and 80mm mortar, light and heavy artillery on patrols during the latter part of the period.

The patrols were aware that their mission of leading the enemy to believe a crossing was imminent in this sector could be accomplished only by aggressive action and boldly making their presence known. The success of the mission was evidenced by the increased activity in our sector after patrolling began, and the large number of troops trapped in sector Lank-Latum-Mudrich and backed up in the Rhur Pocket when several weeks later the Ninth Army crossed the Rhine River in the vicinity of Wessel.

The Assault Gun Platoon in Offensive Action

by 1st Lieutenant Robert L. McMahon[*]

DURING the drives from the Roer River to the Rhine and the Rhine to the Elbe, the 11th Cavalry Group was assigned the mission of protecting the left flank of the XIII Corps of the 9th Army. It was the responsibility of the two reconnaissance squadrons of the group, the 36th and the 44th, to protect the often exposed flank from a possible German counterthrust from the north. The leading elements of the British Second Army and the XIII Corps were not able to keep abreast in their advance, and it was necessary to employ a mobile flank guard.

In this typical cavalry mission of flank security, the assault gun troop was used to support the advance of the reconnaissance troops. One assault gun platoon was attached to each of the troops. This employment proved more successful than keeping the troop intact to fire as a battery.

First, in a swiftly moving, fluid situation there are few occasions when the 6 guns can be effectively and quickly fired in battery. In the mounted action between the Roer and the Elbe there were no occasions when the guns in battery would have been vital to the advance. No formal lines of concentrated resistance were encountered and howitzers in battery were not necessary.

Second, immediate light artillery on mobile mounts can prove invaluable to the reconnaissance troops in their advance from position to position. In the team which results in the grouping of an assault gun platoon and a light tank platoon with a reconnaissance troop there is the combination of armor, fire power, and maneuverability—the characteristics of modern cavalry. With the advent of the light tank, M24, with its 75mm gun, this team received the added punch necessary to carry it through most light opposition.

The formation of this combat command in miniature is left to the discretion of the commanding officer of the reconnaissance troop. His decision should, of course, be based on the advice and recommendation of the platoon leaders of the attached elements. The reconnaissance troop commander should have adequate knowledge of the capabilities and limitations of these elements prior to the employment in any situation.

An excellent example of the most advantageous use of the 75mm assault gun was displayed on April 9, when the 36th Squadron was regrouping at Godshorn, a small town 8 kilometers north of Hannover. Attached to Troop C was the 3d Platoon of Troop E, led by Sergeant Joseph Kuberski, and a platoon of light tanks.

The squadron was in column approaching Langenhagen, led by Troop C in command of Captain John E. Newlin. Lt. Marshall Bivins' platoon was leading when the point team ran into 88mm fire. He deployed his platoon and radioed the information to the troop commander. In the meantime the assault gun platoon had been called up to a railroad embankment which provided excellent defilade for the howitzers. The platoon leader of the 2d Platoon, Troop E, at that time attached to Troop B, was called forward to assist Sergeant Kuberski in firing the platoon. Leaving a radio ¼-ton at the howitzer position, Captain Newlin moved out to act as relay between Lieutenant Bivins, who was observing, and the howitzers.

Because properly scaled maps were lacking, all data had to be estimated, and corrections made at the guns with the use of the graphical firing table. The first few rounds that were fired were smoke in order to aid observation, but they were of little value. The platoon then changed to shell HE M54 and the fuze setting was computed to assure a high air burst. Once the round was located, the fuze setting was lengthened so as to bring the burst onto the target. The gun crews chose their own referring points, and recorded their referred deflections without command.

During the entire process of laying, the forward observer and the relay station were under fire from the enemy guns. The railroad embankment was protecting the howitzers from direct fire from the 88mm guns, but occasional ricochets were landing within 50 yards of the platoon. All the rounds which ricocheted were armor piercing so the efficient firing of the battery was not interrupted by this fire.

To add to the confusion which invariably accompanies such action, Troop B was assigned a mission which required the support of the 2d Platoon. Captain Vernon L. Poynter, commander of Troop E, substituted in control of the 3d Platoon and continued to deliver fire in support of Troop C until the enemy was routed.

The German guns proved to be dual-purpose 88s mounted in concrete emplacements. Their primary purpose was the antiaircraft defense of Hannover, but the proximity of the 36th Cavalry caused them to be pressed into use as antimechanized weapons. Upon later inspection it was clear that the combined efforts of the armored car 37s, the light tank 75s and the assault guns had destroyed 6 of the 9 guns in place. The remainder were abandoned when the gun crews withdrew.

It is obvious that without the help of the cavalry's mobile artillery the entire squadron would have been held up until the position was by-passed or enveloped by dismounted parties.

This action alone is evidence that the assault gun platoon can be used to the best advantage in a mobile situation by attaching it to a reconnaissance troop to provide it with immediate light artillery support. Seventy-five millimeter howitzers can, and do, take the place of field artillery in rapid offensive action.

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[*] Troop E, 36th Cavalry Reconnaissance Squadron (Mecz).

CARDED

GAPA---Aircraft of the Future

by Major Hal D. Steward

"Gapa City," Utah, consists of six shacks and miles of desert sand. But its importance is greater than its size for here the first Ground-to-Air Pilotless Aircraft weapon was launched in middle August.

A heretofore secret guided missile, designed as a potential defense against possible attack by high-speed, high-altitude enemy aircraft, the GAPAs are manufactured by the Boeing Aircraft Company. When perfected, they are expected to be capable of seeking out and destroying possible enemy weapons before they can reach their targets.

Pencil-slim and 10-foot long, 60 GAPA projectiles are to be fired in Utah this year in the first phase of an extended program scheduled to last several years. First test models of the new guided missile are propelled by standard aerojet rocket units. A booster power unit is attached to the tail of the projectile, accelerating the missile to high speed within a few seconds.

The firing range for the GAPA is located in the heart of the Great Salt Desert of Utah. Heat, alkali dust and the blinding glare of the white salt plains make this desert an unpleasant place in the summer.

Firmly embedded in concrete, the GAPA launching tower rises to a height of 40 feet. Made of steel, the tower is strongly stressed and painted a brilliant yellow.

Called "Old Needlenose" by the men who work with it, the projectile is armed after it has been hoisted into place on the tower. The missile is armed with remote control ignitor fuses.

Four theodolite stations are situated in the desert to track the missile from launching to landing so that a complete record of the GAPA's progress can be had for later study.

Three hundred yards from the launching tower is the "dugout," headquarters of the firing operation. Here the switch is thrown to send the missile shooting into the sky. It is an underground structure of heavily reinforced concrete thickly piled with sand.

Because of the tests being conducted at "Gapa City," sometime in the future it may be possible to develop man-carrying aircraft capable of bolting around the world in a matter of hours. These tests may well be the forerunner of rocket ships.

"Once problems of control and stability are solved," it has been pointed out by W. E. Beall, Boeing engineering and sales vice-president, "the principles involved in this new weapon may have far-reaching effects on the design of future passenger or cargo-carrying aircraft."

A 30-man staff operating out of Wendover Field, Utah, is carrying out the GAPA test program. Head of the Boeing GAPA unit is Richard H. Nelson, who served as project coördinator on Boeing's B-17 Flying Fortress construction during the war. Engineering staffs in the Boeing plant at Seattle, Washington, are working on further details of the GAPA program.

What is the speed of the GAPA? How high did she go? What is her effective range? The answer to these questions must be discovered by the engineers.

How the GAPA is manufactured and details of its design are War Department secrets. Only recently did the War Department make public the fact that work on the GAPA has been going on now for more than 15 months.

This heretofore secret guided missile, designed as a potential defense against possible aircraft, is being experimented with in the Great Salt Desert of Utah. It is pencil-slim and 10 feet long.

AAF Photo

Editorial Comment

Captain Heartsill.

CAPTAIN CHARLES E. HEARTSILL, our former Associate Editor, was relieved on September 1st in order that he could be discharged and returned to civilian life again. Captain Heartsill has served the JOURNAL staff for over a year and a half. Always a hard and conscientious worker, he had the bad luck to join us when the going commenced to get tough. He practically ran the journalistic department singlehandedly and the continued high quality of our magazine was due largely to his untiring efforts. He leaves the army to conduct his own business, a photographic studio in Marshall, Texas. The Executive Council joins the staff in extending our thanks to Captain Heartsill for his untiring efforts in maintaining the high standards of the ARMORED CAVALRY JOURNAL and wishes him the greatest of success in his new business venture.

NEW ASSOCIATE EDITOR

Major Hal D. Steward is our new Associate Editor. We are very fortunate in securing the services of a veteran journalist for this job. Major Steward, who was a newspaperman and free-lance writer in civilian life, spent nearly two years in the South and Southwest Pacific Theaters. He has five major Pacific campaigns to his credit and for a year was Public Relations Officer of the First Cavalry Division. He is the author of *The First Was First,* a short history of the First Cavalry Division and its Pacific campaigns. Before coming to the ARMORED CAVALRY JOURNAL he was assigned to the War Department.

* * *

STAFF MEMBER DECORATED

Master Sergeant William R. Rossow recently joined the staff of the ARMORED CAVALRY JOURNAL as Circulation Manager and it is a great pleasure to publish the following citation which he received to accompany the award of a Commendation Ribbon from the War Department when he was relieved.

"For outstanding service from 21 January to 18 June 1946. Master Sergeant Rossow trained and organized into an efficient operating force a group of personnel to record, route, and regulate the movement of cases coming before the Army Ground Forces Integration Board. By his initiative, dependability and success in meeting unexpected situations he contributed outstandingly to the progress of the Integration program."

* * *

SOLDIERS COMMEND LEADERS

In view of the widespread publicity given to adverse criticism of the so-called "caste system" the following letter is quite refreshing. It is dignified, sincere and spontaneous. It is a pleasure to print it in this column.

SPECIAL NONCOMMISSIONED OFFICERS CLASS NO. 2
Fort Benning, Georgia
6 August 1946.

SUBJECT : Appreciation and Commendation.

TO : Brigadier General Whitfield P. Shepard, The Assistant Commandant, The Infantry School

THROUGH: The Commandant, The Infantry School Fort Benning, Georgia.

1. We the undersigned members of the Special Noncommissioned Officers Class No. 2 are so full of appreciation for the fine leadership which the officers listed below have given us and for the splendid example that they have set for us as soldiers to follow that we wish to go on record in this way in expressing our appreciation.

Colonel Theodore Andrews
Colonel William O. Blandford
Colonel Charles U. Knaub
Lt. Colonel Hubert C. Hicks, Jr.

Lt. Colonel Duke E. Jones
Lt. Colonel Clair B. Mitchell
Major Charles W. Sample
Major Charles H. Schrader
Major John E. Tilton
Major Warren E. Walters
Captain William K. Dielman
Captain Clifton C. Fox
Captain Edward Gorecki
Captain Edward B. Kitchens
Captain Roy B. Quinn
Captain A. Q. Smith
Captain William H. Wikoff
Lt. Norman L. Engard

2. We are fully aware of the current discussions in the press about the so-called "brass" in the Army which would lead the American public to believe that the rank and file of Army officers are hard-boiled and cold-hearted toward enlisted men. We feel that if the American public at large were aware of the type of leadership that we soldiers have enjoyed here at Fort Benning under the guidance of the officers listed that even the critics would change their attitude as reflected in part of the press.

3. The officers listed have not only been excellent instructors but they have demonstrated a sincere and intense interest in our welfare from every point of view. Thus, setting a lofty example worthy of emulation by us as noncommissioned officers who in turn must prove our value as such in the hearts of the privates.

4. It is hoped that the Commandant of The Infantry School will make known to these officers the contents of this letter as a humble and sincere expression of the appreciation of the signers of this letter.

Signed by 92 Members of the Class.

* * *

Letter to the Editor

Headquarters Replacement Training Center
Office of the Commanding General

Fort Knox, Kentucky,
9 August 1946.

Colonel E. M. Sumner, Editor,
Armored Cavalry Journal,
1719 K Street, N.W.,
Washington, D. C.

Dear Sir:

It was quite a thrill to receive the first issue of the Armored Cavalry Journal. Only those officers who lived through the years of struggle hoping to see Cavalry regain its rightful place in the sun can appreciate the significance of this step. At last, true cavalrymen and not merely horsemen have ridden to the front. At last cavalrymen are recognized for what they really are—"soldiers who fight mounted," and not merely "soldiers who ride horses."

I look forward with confidence to the day when it will no longer be necessary to prefix the name of our branch with "armored." I do think it is necessary now, during the transition and educational stage. But the day will surely come when the word "cavalry" by itself will mean to all what it has always meant to true cavalrymen—"soldiers who fight mounted" regardless of what their mount may be.

There is no use to voice regrets now but I cannot help but be saddened by the thought that so many great cavalry units will go down in history by another name. Approximately one-fourth of our divisions in Europe on V-E Day were cavalry but the world may never know them as such. There is some hope, however, that in our school system of the future there will emerge an ever-increasing tendency to refer back to their exploits as "cavalry action," particularly if the Journal and cavalry officers continue to point out the facts.

It should be apparent now more than ever before in history, that where there is ground combat decisive results can only be obtained by an army properly balanced between dismounted (Infantry) and mounted (Cavalry) units. We have the comparatively fresh examples of World War I where we were totally lacking in cavalry and World War II where we had a sound and proper balance. The student need only look at the comparative results from which a child can derive the reason.

It will soon be time to see that this step is carried to a logical conclusion in the designation of units. The term "armored infantry" is not applicable to mounted soldiers of modern cavalry. They are cavalrymen if there ever were cavalrymen. They now have "horses" from which they can use their weapons with deadly effect. No longer must they rely on the short-range pistol or the arm's-length saber from an unstable seat astride a horse. As they "gallop" toward their objective today, they confidently pour a sheet of fire from powerful long-range weapons that make their "charge" irresistible. Can you not imagine the sheer delight and cheers of Stuart, Forrest and Sheridan could they but return to command the cavalry of 1946?

I have heard officers express regret at the relegation of the horse to the fringe of the world's battlefields. But I have not heard such sentiments expressed by those who, like myself, have seen the roads and trails strewn with the bloated carcasses of faithful animals that were forced to pass through the hail of air and ground attack. *There were no foxholes for horses.* But the mounted soldier was not to be denied. He broke and trained new "horses." The record is conclusive. No scoffer can laugh it off. Once more, and for the first time since the days of '65, the cavalryman can hold his head high; he proved himself in battle. The mounted soldier clinched the most decisive victory in the history of war.

I congratulate the Armored Cavalry Association. I look forward with confidence to the successful restitution of cavalry in the teachings and thought of our military school and in the organization and training of our ground army.

R. W. Grow,
Brigadier General, U. S. Army,
Commanding.

* * *

Jeb Stuart, sired by Gordon Russell, and grandson of Wilton Lackey, is dead.

Prewar devotees of the National and other well-known horse shows will remember this great horse as one of the best-known Army jumpers ever to appear in public.

Starting his career in 1933 he was selected for the 61st Cavalry Division Horse Show Team (New York) and stayed on the team until it was disbanded in 1940. His collection of military trophies and ribbons totals 304, of which 255 are in the first three grades of Champion, Reserve, or Blue. His shows included West Point; National; Piping Rock; Squadron "A," New York; New York Riding Club; Brooklyn; Staten Island; Essex Troop, Newark; Atlantic City; Orange; Westchester; New Haven; Chicago; Albany; Governor's Island; and Stamford.

Purchased at the age of three by Colonel Herbert H. Frost, Jeb was schooled and ridden by his owner. He was retired in December, 1941, at the time Colonel Frost went to duty with the Armored Force.

Jeb Stuart taking the triple-bar with his owner Colonel Herbert H. Frost.

11th ARMORED DIVISION ASSOCIATION NEWS

THE THUNDERBOLTS had plenty of problems to lick before they shoved through Linz toward Vienna, so we are not downhearted because our attempts to get the Division Association rolling, have run into some rugged obstacles. The Division files have been located in St. Louis and as soon as the bureaus with priorities to use them are satisfied, they will be turned over to us. Your help in getting every name and address you possibly can, to your Secretary, will be the best assurance that the records we have are correct—invest a penny post card and let us have all the dope you can. Address: The Secretary, 11th Armored Division Association, 1719 K Street, N.W., Washington 6, D. C.

The Division Association was not organized until August 15, 1945 in Gmunden, Austria, when it was found that there was no remaining record of the addresses of the 12,000 men who had already left and the secretary had only 6,000 names of eligibles. Since then, mainly through the efforts of a few men we have contacted, and others who have replied to a notice which appeared in newspapers throughout the country, our list has grown considerably.

We bumped into John Case of CCB in Sears Roebuck and he knew the address of Joe Bradford of the 22d. Luck also brought the two of us together at a soft drink stand in Franconia, New Hampshire, and we added to our group, young Dick Dufour of the 63d A.I.B. Milton Silver, CCA, writes of a group meeting in Brooklyn and John Janecek of the Band, has contacted quite a few more men on a recent trip to Milwaukee and Chicago.

Scattered around the map are these former commanders: Howard, Lowe and Palmer in the ETO—Mullins has the 25th Div. in Tokyo. Bell reported convalescing in a Long Island hospital—Yale in Paris—Kilburn in Vallejo, California and Brooks and Dager in Atlanta with the 7th Army.

We are working on a NEWSLETTER which we want to get out as soon as possible, so send us a few words about what you are doing, and your ideas as to where our reunion meeting should be held. So far, Chicago has the most approval, although St. Louis, Denver and Milwaukee have a lot of votes.

We will sign off with the reminder that we want to get that NEWS. If we get enough replies from the Executive Committee (made up of your unit representatives) we will give you the preliminary plans for our first reunion.

* * *

AN EDITORIAL

CARDED

Atom Bomb Commentary

by Major Hal D. Steward, Associate Editor

(Author's Note: *Background material for this article was obtained from Commander L. V. Julihn, member of the Public Information Staff of Joint Army-Navy Task Force One. However, the opinions expressed and conclusions reached are the author's own.*)

SELF-STYLED "military and naval experts" have jumped to the conclusion that the results of the Bikini Atom Bomb tests are the final word on whether there will be an Army, Navy or Air Force in the future. Such talk and conclusions are foolish.

Cries of "the atom bomb eliminated the need for a Navy"; "the Air Force is now outmoded and from now on everything will be rockets" are heard everywhere. Nothing in any of the atomic bomb tests substantiates these contentions.

The purpose of the Bikini tests is greatly confused in the minds of many. Misconceptions of the results of the experiments have cropped up everywhere.

The Bikini tests in no way definitely prove that the Navy is here to stay, is subject to radical conversion, or that it will be obsolete in offense or defense in any future wars. From information available, it is not believed that the atomic experiments in the Pacific were held to determine what armed services will have to be eliminated from American defense plans. It is much too early in the game to reach any such conclusions. In all probability it will take years of research, experimentation and development to determine what the future of the armed forces will be in relation to the atom bomb.

Basic purpose of the Bikini experiments was to obtain information on a graduated scale from maximum to minimum of the effect of the atomic fission on a target array composed primarily of Navy ships, but also including many other types of military equipment. As an important corollary live animals were used to obtain data on the possible dangers to service personnel inherent in atomic explosions. From this basic information, Joint Army-Navy Task Force One (Operation Crossroads) officials hope to obtain valuable guideposts to the most efficient offensive and defensive strategy and military equipment in an atomic age.

The Bikini target array resembled no known naval array, either at an anchorage or at sea. Twenty-three ships were grouped in a tight circle which normally would have floated two or three ships at anchorage or one capital ship in a task group formation at sea. Had all 23 ships been sunk by the Atom Bomb blast, the question of the need for a future Navy would not have been settled. The results would have proved that 23 ships should not be grouped in a circle of 1,000 yards radius. This fact was learned long before atomic bombs were a reality.

The picture must be looked at objectively. The future of the Navy depends entirely on the ability of the scientists and inventive engineers to create a transporting medium and an attacking force capable of carrying out the present mission of the Navy more effectively than any other means. Perhaps atomic explosives and new developments in long-range aircraft may provide better methods of carrying an offensive across the sea than can be supplied by the Navy. As yet, however, no planes have been devised which can carry the personnel, heavy equipment, and all other incidentals which must accompany a large-scale invasion of a country.

This same reasoning can be turned on those who maintain that rocket warfare has outmoded both the Air Force and the Navy. American self-propelled rockets are still in the drawing-board stage. Drawing-board rockets can never replace aircraft as long as they remain on the drawing board. Until something else can take over their functions the Navy and Air Force will remain in existence.

Second basic fact of the Bikini tests is that the tests while not creating a medium for the replacement of the Navy or the Air Force are devised to show us how to make U. S. fleets as safe and effective as possible in an atomic age.

Test Able (air drop) at Bikini gave the sincere scientists much of the basic data for which they were seeking. The test indicated that protective alterations must be considered and developed if personnel on board naval ships are to be saved. Many other things about the bomb were discovered that will be revealed at a later date when the information has been fully evaluated.

Test Baker (detonation of an atom bomb just under the surface of the ocean) provided information on the ability of naval hulls to withstand blast effects of atomic power. It should indicate what means are necessary to improve hull designs, and what tactical formations are best to protect a fleet against an atomic blast.

Test Charlie (detonation of an atom bomb deep in the ocean) will take place in 1947 as scheduled.

Both military and naval experts know that the use of the atom bomb in warfare calls for radical changes in equipment, tactics and technique. Certainly some method is going to have to be devised to protect industries from the blast of the bomb. Perhaps large industries will have to be moved underground or enclosed in solid walls of heavy lead or concrete. These things are under consideration now and only successful experimentation and development will find the correct solution.

But, in the meantime atomic bomb thinking must not go overboard. Military men especially should look at the atom bomb and its potentialities from an objective point of view. Persons must not be taken in by stories of the atomic bomb written by overenthusiastic and uninformed writers.

Legislation was passed by Congress on July 26, 1946, and signed by the President on August 2, creating a new civilian agency with complete control over atomic energy development. The new law provides for a commission of five civilians who will direct all future atomic developments.

The Army will have a consulting and advisory role in relation to this commission.

* * * *

CARDED.

Supply of An Armored Division in Combat[★]

Extracts from a Letter from Colonel E. Busch[★★]

PRIOR to the invasion of France, it was impossible to obtain an agreement on the daily POL [petrol, oil, lubricants] requirements of an armored division. The estimates varied between wide limits—as nearly as I can recall, between 40,000 and 100,000 gallons of gasoline per day.

These data were compiled by Lieutenant Colonel W. A. Boyle, Division Quartermaster, 6th Armored Division, from records maintained by his office during the campaign through France, Belgium, Luxembourg, and Germany for the period 27 July 1944 to 9 May 1945, inclusive.

The 6th Armored Division played a full part in the campaign. During the initial phase, it operated in the Brittany peninsula, later moving to the Eastern Front.

POL and Rations consumed by the 6th Armored Division during the campaign of Third Army through France, Belgium, Luxembourg, and Germany, starting at the Normandy beaches and ending at Altenburg, Germany, for the period 27 July 1944 to 9 May 1945, inclusive—total 287 days:

Item	*Consumed*	*Average per Day*
V-80 Gasoline	5,497,770 gal.	19,156.00 gal.
V-80 per food ration		1.32
Kerosene	3,815	13.3
Diesel	6,552	22.8
White Gasoline	1,635	5.7
73 Octane Gasoline	3,830	13.3
SAE No. 10	13,457	46.8
SAE No. 30	60,675	211.4
SAE No. 50	45,205	157.5
SAE No. 90	7,105	24.7
GP No. 1	23,856 lbs.	83.1 lbs.
GP No. 2	40,922	142.5
GP No. 3	6,883	24.0
GP No. 4	129	.45
[1]Coal	296 tons	1.00 ton

Approximate tonnage: 73.32 per day.

Rations consumed during the 287-day period:

	Total	*Average per Day*	
"A"	2,344,605	8,169.35	
"10-1"	929,385	3,238.28	
"K"	576,566	2,008.94	
"C"	315,738	1,100.13	
"D"	(104,616)	(364.50)	No ration. Used as supplement.
TOTAL	4,166,294	14,516.70	Less "D's"

Approximate tonnage: 30.6 per day.

POL and Rations consumed by the 6th Armored Division during the last 98 days of the campaign, 1 February 1945 to 9 May 1945. This was a period of intensive operations starting in the vicinity of Luxembourg and ending in Altenburg, Germany.

Item	*Consumed*	*Average per Day*
V-80 Gasoline	2,422,620 gal.	24,721.00 gal.
V-80 per food ration		1.75
Kerosene	3,170	32
Diesel	2,975	30
White Gasoline	840	9
73 Octane Gasoline	3,830	40
SAE No. 10	2,605	26
SAE No. 30	26,925	274
SAE No. 50	23,245	237
SAE No. 90	3,965	40
GP No. 1	10,048 lbs.	102 lbs.
GP No. 2	20,070	204
GP No. 3	482	5
GP No. 4	77	.75
[1]Coal	66 tons	.67 ton

Approximate tonnage: 93:45 per day.

Rations consumed during the final 98-day period:

	Total	*Average per Day*
"A"	785,769	8,018
"10-1"	228,615	2,333
"K"	222,120	2,266
"C"	142,980	1,459
"D"	none	
TOTAL	1,379,484	14,076

Approximate tonnage: 29.48 per day.

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[1] Does not include quantities found locally within unit areas.

[★] Military Review.

[★★] Quartermaster Corps.

[1] Does not include quantities found locally within unit areas.

OTHER BRANCHES

Major General Clift Andrus

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"The Field Artillery is vitally interested in this subject of 'Other Branches' which you are so ably presenting. Since Field Artillery is essentially a supporting arm, its success in battle will depend to a considerable degree on its knowledge of the tactics and technique, as well as of the viewpoint and mental and physical status, of those whom it supports. As a versatile and extremely powerful member of the team in battle, it renders the Infantry and Armor the most effective assistance when it knows how each executes its part in the effort of the whole.

"Mutual confidence and understanding are vital to success in combat. These can be built up through peacetime training and exchange of ideas. Your new department makes a most influential and forceful contribution to such peacetime training and exchange of ideas. I am happy indeed, to add my commendation to the Armored Cavalry Journal for this most praiseworthy development."

Clift Andrus

Major General, U.S.A.,
Commandant, The Field Artillery School

CARDED

The Field Artillery

by Colonel Robert F. Hallock*

The Artillery Mission

THE book says that the mission of the field artillery is to support the other arms. There are certain freethinkers who claim that this is an understatement of the case, and that a bit more consideration of the effectiveness of the artillery arm as a means of killing the enemy, and less as a mere auxiliary weapon, would get the battle won more quickly and more decisively. Be that as it may, the artilleryman is trained to think in terms of the battle as a whole, and to seek the means and methods whereby he can further the action of the entire force. This has been accomplished by a generation of indoctrination in the concept of the "supporting arm," and there are few, if any, artillerymen who have any inclination toward "empire building" or toward the separation of the field artillery from its place in the close-knit fighting team of all arms.

On the contrary, every effort is being made—in training publications, in the schools, and in unit training—to tie the field artillery ever closer to the supported arms. It has long been apparent that the artilleryman must spend more time and thought on the study of the technique, tactics, and problems of the assault elements than those supported elements spend on the study of the field artillery. It is obvious that the impetus of support must come from rear to front, and that the job of the artillery is to *deliver* the necessary support, and not wait for anyone to come and ask for it.

Combat Efficiency

Nevertheless, it takes at least two to make a partnership, and the better the two partners understand each other the better that partnership will function. One of the greatest of the difficulties faced by the artilleryman during the past war was the problem of convincing the supported units of the effectiveness and power of the readily available artillery. A single example will illustrate the point. An infantry regimental commander was concerned about a certain heavily reinforced German pillbox. A forward observer took it under fire with his light battalion without visible effect. The FO said, "Colonel, I can get an 8-inch howitzer battalion on it if you will OK it." The colonel demurred, mentioning complicated channels of command and communication and long delays, but finally said, "Go ahead!" In a few minutes the pillbox had been destroyed, and from then on that regimental commander demanded 8-inch howitzers on any and all targets, including infantry patrols and rumored light mortars!

An Analysis of "Support"

Let us analyze this mission of "support." It does not necessarily mean the physical presence of the weapon with the supported troops. Modern self-propelled, high-speed, armored artillery can move and fight with the assault elements of infantry, and armored cavalry. It has done so in the past war, and will continue to do so whenever appropriate. But, with available range from 0 to 35,000 yards, and traverse up to 60 degrees—all available in a few seconds without moving the carriage—a primary attention should be given to the maneuver of the fire of the artillery, and only a secondary attention given to the maneuver of the pieces themselves. Of course, if the pieces are located well forward, it facilitates communication, liaison, and the smooth operation of that "close-knit fighting team." Range is built into artillery cannon, not for the purpose of permitting them to sit well back of the front lines, but to permit them to reach out into the depths of the enemy position and hit him where it will hurt the most.

The Three Artillery Missions

The Air Forces have thoroughly indoctrinated us all with the fact that they have three missions: first, to gain supremacy over the enemy air forces; second, to isolate the battlefield; and third, to render close support to the ground forces. There is a close parallel between the missions of the air forces and the missions of the field artillery. First, the artillery must engage in counterbattery operations to protect the supported units from enemy artillery action and to secure its own freedom to pursue its other missions. Second, it must disrupt and destroy enemy communications, supply, and other movement and installations in the rear areas. Third, and finally, it must neutralize or destroy those enemy forces and installations which interfere with the action of our own forward elements.

What are the priorities of these phases of the artillery mission? That is a highly debatable question, and the best answer is the good old stock phrase, "It depends on the situation." If the enemy artillery is strong, active, and effective, counterbattery operations must receive great attention. If the enemy is engaged in rushing up reinforcements and supplies in great quantity, isolation of the battlefield becomes of primary importance. If the enemy infantry is strong, well-armed, well-disposed, and well-led, most attention must be given to close supporting fires.

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*Director, Department of Combined Arms, Field Artillery School.

Handling of Missions

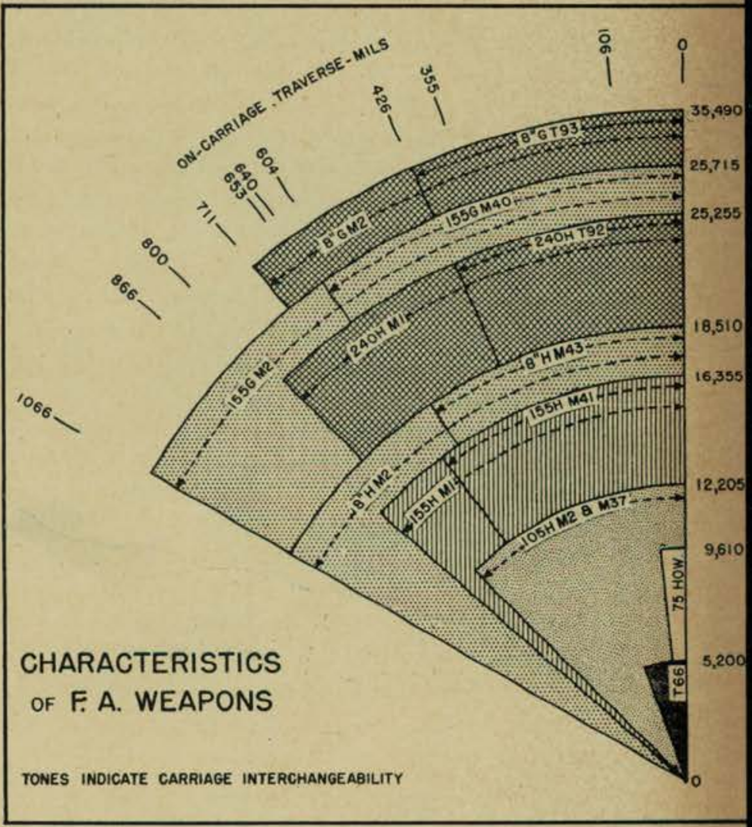
Fortunately, this problem is not as difficult as it might seem at first glance, and for two reasons. One is that the artillery cannon is a powerful and versatile weapon, and can handle any or all of these missions in rapid succession. If we consider the battery or larger unit, it can handle them all simultaneously. Certainly, a two-howitzer battery of 240s cannot fire as many rounds on a counterattack in as short a time as a six-howitzer battery of 105s, nor can a 105 howitzer knock out an important bridge at 22,000 yards. However, it may be stated that all types of artillery weapons can and do undertake all types of missions with good results. The second reason is that the field artillery is organized and equipped for the purpose of handling all of these missions at the same time. The bulk of the close supporting fires will normally be furnished by the division artillery. The corps artillery has the medium range and long-range howitzers, as well as guns which are particularly well adapted for the counterbattery rôle and for the isolation of the battlefield.

Employment

The two charts show the characteristics of the principal field artillery weapons. Let us review briefly their usual employment. The horse-drawn artillery is out. It was a lot of fun in peacetime, but has no place on the modern battlefield. Some pack artillery will remain. It is expensive in manpower, space, and labor, and is not needed very often. When it is needed, it is needed *urgently, and nothing else can do the same job.* Airborne units are equipped with the same weapon, but it is deficient in range and hitting power for this mission. All other types of artillery are now both towed and self-propelled. There is a tendency toward the self-propelled mount in the future, for ease and speed of going into and out of action, and, in the heavier types, for decreased shipping and road space and economy in manufacture. Limiting factors on this trend are: the requirements for economy in use of motor fuel, for heavier bridging equipment, and for air transportability.

The 105mm howitzer is the standard, light, direct support weapon. We now have both four- and six-piece batteries, with consideration being given to standardization on the six-piece formation. There are three battalions in each infantry and armored division. The 155mm howitzer is a tremendously versatile weapon. Its characteristics are similar to the 105 but it has a greater range, and a greater weight of metal and explosive in its projectiles. It has been considered for the rôle of direct support, and is accurate and effective on all types of missions at ranges up to 16,000 yards. It is a fine corps artillery weapon for all missions, especially that of reinforcing the division artillery. One battalion is organic to the infantry division; and one is being considered for inclusion in the armored division.

In addition to the above, we find in the corps artillery the 155mm gun, the 8-inch howitzer, the 240mm howitzer, and the 8-inch gun. The guns are high velocity weapons, and are not economical on close support work except for destruction of vertical targets of small size, but are good for counterbattery fire and isolation of the



CHARACTERISTICS OF F. A. WEAPONS

TONES INDICATE CARRIAGE INTERCHANGEABILITY

		75mm HOW M8	105mm HOW M2A2(T) M37(SP)	155mm HOW M1(T) M41(SP)	8" HOW M2(T) M43(SP)	240mm HOW M1(T) T92(SP)	155mm GUN M2(T) M40(SP)	8" GUN M2(T) T93(SP)	RO LAU
WT. OF PIECE & CARRIAGE IN TRAVELING POS. (TONS)	T	72	2.49	6.35	14	HOW 23.86 CARR 25.55	15.05	GUN 26.31 CARR 25.55	
	SP	—	19.75	21.5	41.5	64.5	41.5	67.0	
TIME TO EMPLACE (MINS)	T	3	3	5	30 to 360	60 to 360	30 to 360	60 to 360	
	SP	—	1	1	1	5	1	5	
WEIGHT OF PROJECTILE (LBS)		14.7	33	96.1	200	360	95.1	240	
RATE OF FIRE (RDS/MIN)	MAX	6	4	3	1	1	1	1	
	NORM	3	2	1	1/2	1/2	1/2	1/2	
EFFECTIVE AREA OF BURST (YDS)	LATERAL	30	50	60	80	100	60	80	
	RANGE	10	15	18	20	25	18	20	

References: TM 9-2300, 7 FEB 44 and appropriate TM's

(Effective area of burst FM 6-40, 1 JUNE 45.)

battlefield. The 8-inch howitzer is a remarkably accurate piece, and is a prime favorite with all who have used it.

OLD CONCEPT RIDICULOUS

The old concept of heavy corps artillery was that of a weapon which was cumbrous and slow-moving, which took days to emplace, and was brought into action days after the battle was joined, when the divisions had met organized resistance that had to be destroyed by "siege guns." Two incidents from the past war will illustrate the distance we have advanced from such a concept. One May morning an infantry battalion commander was ordered to capture a certain hill. He issued his orders, deployed his battalion, and advanced to the assault. Several hours later his troops, hot, dusty, and tired, reached the far side of the hill—where they found an 8-inch howitzer battalion in position, firing merrily at the enemy. At another time, the commanding general of a certain armored division registered a very heated protest. The reason was that a heavy artillery unit, in going into position, had been so atrociously badmannered as to cross his route of march, and in the process had cut the advance party off from the point of his advance guard!

In the corps artillery, the field artillery observation battalion is organic. Its heaviest weapon is the Bazooka, but it is the eyes and ears of the corps artillery, and the corps can't do business efficiently without it. With its flash-ranging, sound-ranging, and radar-ranging equipment, it can produce locations of enemy artillery when no other agency can. Its meteorological and survey sections furnish data which permit accurate fire when observation is impossible.

THE PAST

It appears that the outstanding progress in the artillery during the past war has been in the development of the tactics of the reinforcing corps artillery, and in the process of pulling such units into that "close-knit fighting team." Twenty years ago there were many good batteries, but few battalion commanders had the opportunity to train their battalions as such. In the 1930s the development of the battalion fire-direction center began to pull battalions together as units. Soon thereafter division artilleries began to take shape, and in the immediate prewar and early war years, and especially in the large-scale maneuvers of that period, the battalions of the division artilleries and their supported units began to develop their teamwork. However, the great mass of corps artillery battalions and their higher headquarters had no opportunity to learn their combined team play until they reached the battlefield. This is a serious, hard-learned, and costly lesson which must be kept in mind by commanders of all arms at all levels during the postwar training years.

THE FUTURE

What the future may hold, no man can foretell with assurance. The merger of the seacoast, antiaircraft, and field artillery into one artillery arm is already being planned. It should result in a broadening of knowledge and vision on the part of all artillerymen. It must not result in any decrease in technical skill on the part of any artilleryman. As to weapons, rockets are still in their infancy and already have proven their worth in battle. Jet propulsion, atomic warheads, atomic propellants, new fuels, new power plants for vehicles, guided missiles, all, with many others, known and unknown, will materially affect the artillery. But whatever its nature, cannon will always be essential on the battlefield, and its missions will continue to be to gain supremacy over the enemy's weapons, to isolate the battlefield, and to assist the assault forces in the destruction of the enemy.

New Regular Cavalry Officers

Seventeen Cavalry officers were among the additional 900 officers appointed in the Regular Army on August 28, 1946. These are in addition to those that were appointed in June.

The permanent rank to which they were appointed in the Regular Army appears before their names while their temporary ranks appear after.

2d Lt. James C. Vaughn (1st Lt.)
2d Lt. Kenneth W. Ramussen (2d Lt.)
1st Lt. J. R. Abernathy, Jr. (Capt.)
1st Lt. William S. Miller (Lt. Col.)
1st Lt. Harry G. Sanders (Major)
Capt. John J. Prokop, Jr. (Capt.)
1st Lt. Donald C. Felton (Lt. Col.)
Capt. Charles R. Keasey (Lt. Col.)
2d Lt. Richard E. Stanley (2d Lt.)
Capt. Charles H. Hayhuff (Lt. Col.)
Capt. Donald F. Gibbons (Major)
1st Lt. Harold D. Woodruff (1st Lt.)
1st Lt. Edward J. Vincent (Capt.)
1st Lt. Robert J. MacDonald (Major)
1st Lt. Paul A. Baltes (Capt.)
1st Lt. Henry R. Howell, Jr. (Major)
1st Lt. Alfred Yorston, Jr. (Capt.)

CARDED

Cooperative Training

Infantry and Armor★

PRIOR to and during World War II, much was written about the need for coöperative training among the various types of combat arms. It was a generally accepted principle that Infantry, Artillery, Armor, and Air Corps should all know how to work together. In spite of this accepted principle, however, units that were insufficiently trained in working with other units frequently entered combat. Practically all reports from the fighting fronts emphasized the necessity for coöperative training of all types of units. In some instances, these reports were specific with regard to the points to be covered; in other instances, the reports were merely general statements which cited the need for coöperative training.

In the paragraphs which follow, the sentences in italics have been extracted from WD Pamphlet 20-17, "Lessons Learned and Expedients Used in Combat," and bear either directly or indirectly on the subject of coöperative training of infantry and armor. By closely examining these statements from combat veterans, it is possible to draw certain definite conclusions as to the value and scope of coöperative training.

"Leadership is based on knowledge. First, every officer and enlisted man must know his job; . . ." (This) *"is obtained in training; . . ."*

Whereas most military men readily accept the truth of this quotation, the fact is often overlooked that the knowledge itself must necessarily include a great deal of familiarity with the tactics and technique of supporting units, or of units that are acting in a supporting rôle. This knowledge can be obtained in many ways, but, primarily, it is acquired by practical work and training with the different types of units. Every officer and enlisted man is expected to study War Department field manuals and other publications in order to acquire the basic elements of knowledge. *"Remember the little things make or break you in battle. Don't pass over your Field Manuals and Army Regulations lightly; all the materials you need in battle is included in them. It is up to you to dig it out."* By thorough study, the military man learns through the experiences of others, but this study can become of value only by practical application of the principles learned. As the leader studies, he puts his knowledge to a practical test by working in the field, first with his own unit, then with his own unit as part of a larger unit, and finally with his own unit combined with units of other arms. Because of the importance of armor in present day warfare, it is essential that infantry and armor take part in coöperative training. They thus will learn to work together. This training is so much a part of practical knowledge, that, if leadership is based on knowledge, axiomatically, leadership is based on coöperative training.

"False alerts tend to make gun crews skeptical. Some units regard any tracked vehicle as a tank, and promptly report it as such. This destroys the efficiency of the warning system. Front-line troops should be thoroughly familiar with identification of enemy armor."

Although this quotation applies primarily to enemy armor, is is necessary for personnel to learn to identify vehicles of our own units, as well as those of the enemy. The best way to teach troops the difference between a tank and an ordinary tracked vehicle is to show them the actual vehicles. Such a demonstration should be one of the first steps in coöperative training. The armored unit should furnish vehicles and personnel to train the infantryman, and the subject should be covered in such a way that the infantryman will be able to recognize by sight, sound, or silhouette, all of the common types of friendly armor. He should also be able to tell at a glance the difference between a tank and a half-track, or a light tank and a medium or heavy tank. By thus becoming familiar with the armored vehicles of his own Army, the infantryman, to a certain extent, automatically learns to identify enemy armor, and at the same time, he learns how to differentiate between the common types of enemy armor. Although it is true that he may not be able to differentiate between a German Mark IV or a Mark V, he at least will be able to tell whether the vehicle in question is an enemy light or heavy tank or an enemy half track.

While the infantryman is learning to identify armor, the tanker should be given an opportunity to examine infantry weapons and other important items of equipment. He should hear the various infantry weapons fired while he is near the location of the gun, and later

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★From The Infantry School.

while he is near the point of impact of the weapon being fired. In this way the tanker will learn to recognize infantry weapons by sound. He should also be given training in identifying friendly infantrymen at a distance. Some of this training should be conducted with the tanks buttoned up and in motion so that the tanker will learn to identify friendly troops and weapons in spite of the noise and restricted vision.

"Every soldier should be given a ride in a buttoned-up tank to show him the limited vision and field of fire, and the closed-off feeling of the tankers. It will do much to counteract the dread of a tank attack, and will increase faith in his own ability to resist one."

Although this quotation is specific as to one small point of training, it bears on a subject which is an important part of training—the capabilities and limitations of different weapons and units. Infantry should understand the capabilities and limitations of armor—and armor should understand the capabilities and limitations of infantry. This is a training subject which can be easily arranged and which can be both interesting and highly instructive to the participants. Armored personnel, when used to instruct infantry, have an opportunity to do worthwhile boasting about the strongpoints of their equipment; also they have an opportunity to inform the infantryman of their weak points and thus seek from him the coöperation and protection which is often necessary to make an armored attack successful. This instruction should cover the ability of tanks to cross various types of terrain, the ability of the tank crew to see and hear, and to aim and fire their armament while at a halt and while moving. It should also cover the difficulties involved in the resupply and maintenance of tracked vehicles, and the capabilities and limitations of tanks in the daytime and at night. Another point which should be emphasized is the invulnerability of armor to small-arms and time fire. All the points mentioned above should first be explained to the infantryman. He should then be allowed to examine all of the equipment closely. He should be permitted to fire the weapons and to ride in a tank, and possibly even drive one for a short distance. He should ride in a tank through a dug-in infantry position so that he will see how safe an infantryman is against tank attack when he stays in his hole and refuses to run. This phase of the training should be followed by actual demonstrations of all of the points mentioned, so that the infantryman can see with his own eyes the exact capabilities and limitations of these steel monsters.

The Doughboy should be used in the same manner to train the tanker in the capabilities and limitations of infantry. During this period, the infantryman has his opportunity to boast about the many things that he can do well. At the same time, he has an opportunity to explain to the tanker the things which the infantryman cannot do, and for the accomplishment of which he needs armor to help him. In this training the tanker is shown the characteristics of the principal infantry weapons. He learns the types of location from which they are fired, the ranges at which they usually fire, and the effect of the various weapons on armor plate. He becomes familiar with the methods which infantry uses to combat armor, and the best ways in which to guard against these methods.

As a final phase of the training in capabilities and limitations, the infantry and armor should give short demonstrations for each other which will show the usual tactics employed by their respective units. These preliminary demonstrations should not be in the nature of combined problems, but rather in the nature of a starting point for the more advanced study of tactics to follow later. The demonstrations should be comparatively short, and cover only the more elementary tactical principles. In these first problems the infantry might demonstrate a rifle platoon and company in the attack and in the defense. Similar demonstrations should be given by armor.

"Infantry should be 'married' to the tanks to an extent that one tank company and one infantry company are blended as a unit. . . . The infantry platoons sleep and work with the tank platoons."

This quotation emphasizes the most important part of any coöperative training. In this phase the infantry and armored units should be employed together in the field as definite teams. If possible, the units should be blended together no higher than the company level. Their problems and exercises should be planned to cover all possible phases of technique. To teach technique, squad problems should be planned which involve the use of a rifle squad and a single tank section for clearing a woods, eliminating a strongpoint, or reducing a roadblock. These problems should be followed by platoon problems involving the use of a rifle platoon and a section or platoon of tanks. Infantry and tanks should practice different formations, and should learn when to use each formation. The primary point emphasized in all problems should be coöperation between the two arms. Such training will bring to light many points which must be worked out before the units can function satisfactorily as a team in combat. The Doughboy will learn to point out to the tanker the obstacles to be avoided and the targets on which to fire. This means that the infantryman and the tanker must work out a reliable method of communications. The tanks should have a telephone on the outside so that an infantryman can talk to the tank commander. An AN/VRC3 (300 series) radio with the tanks will make it possible for the infantry company commander to talk to the tanks by means of his 300 radio. Also, a liaison radio car at battalion headquarters will enable the infantry battalion commander to exercise control over the tanks.

The infantryman will learn that when he has tanks supporting him he must protect those tanks. Likewise, the tanker will learn that he cannot advance too rapidly without sacrificing the protection furnished him by the slower Doughboy against Bazookas and antitank guns.

There will be times when the infantrymen can ride on tanks. There will be other times when infantrymen cannot be too close to the tanks without suffering heavy casualties from artillery and mortar fire. The infantryman will learn to be observant for antitank mines, and at the same time he will learn to walk in tank tracks in order to pass safely through an antipersonnel mine field. "*Regardless of the initial formation, it is not essential that tanks and infantry keep their respective positions throughout an assault. A tank must stop to fire effectively, and that is the time for the infantry to press on. Both arms must realize the fact that if one stops, that is not a reason for the other to stop. When tanks are canalized by difficult terrain or are held up by mine fields, it is necessary for the infantry to precede the tanks. The tanks, however, must continue to give the infantry fire support, backing up to high ground, if necessary, to keep the infantry in view.*"

Coöperative training, in order to be successful, requires work, planning, and a spirit of coöperation on the part of both infantry and armor; however, the training is vital and must be done in order to attain success in combat.

Only by real coöperative training will units be able to render reports such as the following one from the European Theater of Operations: "*We rode eight men on a medium tank and six on a light tank, all on the rear deck. We first sent out a wave of tanks buttoned up, put time fire from the artillery on them, and followed with the tanks carrying the men. The artillery observer rode with the leading wave and controlled the fire, setting his fuzes a little high. To insure control by the infantry CO and the tank CO, I put them both in the same tank. The infantry CO hung his SCR-300 on the outside of the tank, and worked directly with that part of his battalion which followed. Infantry company commanders could talk to tank platoon commanders by telephones hung on the back of the tanks. We fought this way for eight days and nights, and the foot soldiers loved the scheme. A disadvantage: It fails to use most of the crew-served weapons. We are going to try to utilize the heavy weapons company by riding it on tanks.*"

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ORDNANCE DEPARTMENT

DEVELOPME
AIRBORNE 40

by Major Tho

There are more than 1,800 different weapons and pieces of equipment supplied by the Ordnance Department to the Army. Of these more than 1,600 were new, or received major improvements during the war. . . .

. . . One man may have an idea, but it is the work of many men and organizations that finally produces a weapon which meets the needs of the arm that uses it. . . .

. . . The process of developing a new weapon and how it is standardized, which is outlined in this article is not widely known, and should prove illuminating. . . .

A NEW weapon does not spring full-blown from the mind of some harried inventor. One man may have an idea, but it is the work of many men and organizations that finally produces a weapon which meets the needs of the arm that uses it. Ideas come from many varied sources: the soldier in the field, tactical requirements, scientific organizations such as the National Defense Research Council, manufacturers, and the Ordnance Department, to name a few. Comparatively few new ideas come from amateur inventors. During the war, ideas from this class of inventors were screened by the National Inventors Council, and any that seemed promising were forwarded to the Ordnance Department.

Examination of Inventions

The National Inventors Council did a magnificent job. An idea of its magnitude can be gained from the following figures. From its inception in August, 1940 until December 31, 1945, there were 202,625 inventions submitted to the Council. Of these inventions 67,541 pertained to Ordnance subjects. After careful review, 2,471 were submitted to the Ordance Department for action, since the Council was not familiar with all the latest developments, many of which were highly classified. About 90 per cent were rejected for various reasons such as duplication or impracticability. The remaining 241 were tested, or received special treatment. As a result, 37 were adopted by the Ordnance Department for use. None of the 37 was a new weapon—all were improvements on weapons in use. This does not mitigate their importance, since these improvements—such as a new sight for the Bazooka or a feed mechanism for a gun—cannot arbitrarily be measured.

As may be seen, every avenue for new or improved weapons was explored. The majority of useful ideas, however, came from the Army, which was natural.

Ideas From Field Encouraged

During the war, the Ordnance Department sent three publications directly to the men in the field to glean any ideas they might have, and to inform them of improvements, or of improvisations that were used by others.

These magazines answered their questions, and the Ordnance Department adopted many suggestions that were made for improvements. "Army Motors" dealt with tanks, combat vehicles and trucks. It informed Ordnancemen of new tricks of which they could take advantage, and published letters and articles from men in the field.

"The Ordnance Sergeant" was slanted principally toward all equipment other than automotive.

Firepower the Ordnanceman's Journal, was a magazine of general interest.

On the masthead of each of these magazines was a statement that all Ordnance personnel was encouraged by the Chief of Ordnance to contribute articles and matériel of interest to other Ordnancemen. These articles were sent directly to the magazine and not through "channels." Thus they allowed the greatest freedom of expression, with the assurance that the suggestions or ideas contained would go directly to the appropriate development division for consideration.

1,800 Weapons

There are over 1,800 different weapons and pieces of equipment supplied by the Ordnance Department to the Army. Of these more than 1,600 were new, or received major improvements during the war. The process of developing a new weapon and how it is standardized is not widely known and should be illuminating.

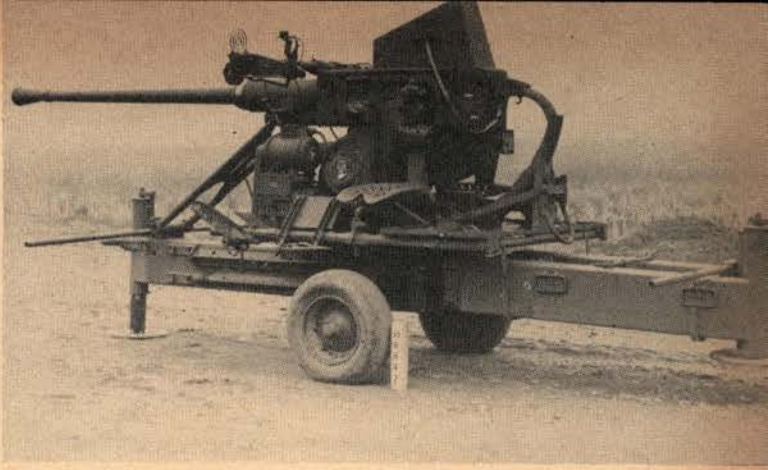
Airborne Infantry was one of the new tactical developments of the war, and necessitated the use of weapons especially designed for carrying in planes and gliders. These troops needed weapons for both offense and defense. One weapon of defense was the 40mm antiaircraft gun which was used against low-flying planes or ground troops.

The Airborne Command did not specify the exact weapons it needed—with dimensions and weights—it merely stated that it had to have an automatic antiaircraft gun similar to the 40mm M2A1 (Bofors). This is an automatic weapon that fires 40mm shells in clips of four at the rate of 120 per minute. Principal dimensions of this gun in traveling position are: length, 225 inches; width, 72 inches; height 79½ inches. Weight is 5,549 pounds. This gun travels on a four-wheel carriage and was much too big to enter any of the cargo planes then in use, in 1942.

★Ordnance Department.

NT OF THE mm AA GUN

*mas G. Gentel**



Specifications called for a gun that could be transported by a C46, C46A, C47 or C54 plane. A major job of redesigning was called for . . . and it was accomplished.

Steps In Redesigning A Weapon

In the Ordnance Department there is a little known committee, but it is one of the most important in the entire Army. It is the Ordnance Technical Committee, and its members are responsible for the weapons used by the Army. They approve or disapprove all new developments, and standardize those weapons that they feel should replace a weapon in use, or should be included as a new weapon. The committee is composed of representatives of all the using arms, including the Navy and Marine Corps, and of the different Ordnance services. During the war, representatives of the British and Canadian Army and Air Forces participated in all the meetings. It was this complete coördination that insured only the best weapons for issuance to our troops. Once each week the committee meets. Each item to be presented is called an OCM (Ordnance Committee Minute), and is prepared by the development division that is responsible for that particular weapon. In the Ordnance Department the Research and Development service has seven development divisions: Tank and Motor Transport, Artillery, Rocket, Ammunition, Small Arms, Aircraft Armament, and Research and Materials. The latter division covers fuels, lubricants, ballistics, various materials, and specifications. The Ordnance Department is divided into four services: Research and Development, Industrial, Field, and Military Plans and Training. Each of these also have representatives on the committee. Every OCM is signed by the representative of the using arm interested in that particular weapon, as well as by those divisions and services of the Ordnance Department that are responsible for the production of the weapon or its components. For instance, when a new gun is developed by the Artillery Development Division the Ammunition Development Division must develop new rounds for it, and since new ballistics must be calculated the Research and Materials Development Division also enters the picture. Further, the Industrial Service is interested in determining whether or not the gun can be readily serviced and repaired in the field. Thus the development of any new weapon is not a one-man show.

On August 28, 1942, an OCM was read before the Committee that recommended the development of an airborne automatic 40mm gun, utilizing as many as possible of the features of the standard 40mm antiaircraft gun. This OCM was approved by the Committee and signed by representatives of the Coast Artillery Board (antiaircraft defense is assigned to them), Air Corps, Air Ordnance and the Ordnance Department.

Preliminary sketches had been made prior to the meeting and work was started as soon as the OCM was approved. Drawings were made, and a contract let to an industrial firm. The firm was manufacturing 40mm mounts, and so was familiar with the problems to be solved. Two pilot models were built so that simultaneous tests could be made both at Aberdeen Proving Ground and the Airborne Command at Fort Bragg.

Pilot Models Exhaustively Tested

The first pilot model was shipped for testing to the Aberdeen Proving Ground late in November 1942. In January 1943 the other pilot was shipped to Fort Bragg for tests and from there to Camp Davis, Headquarters, for the Antiaircraft Testing Board. As a result of the tests, certain modifications were recommended and were incorporated in the manufacture of two slightly different models. Eight of one model and 10 of the other were manufactured and shipped to the North Africa and the Southwest Pacific Theaters of Operation for combat use in the spring of 1943.

The mount bore very little resemblance to the original 40mm Gun Carriage M2A1 after the various changes had been made. The top carriage of the M5 Carriage is similar to that of the 40mm Gun Carriage, M2A1, except for minor modifications to the platform and foot rests, which reduce the width of the mount sufficiently to permit its passage through the doorway of a plane.

The chassis consists of a center base with one permanently attached outrigger, and three removable outriggers which may be fastened to the mount by brackets and tapered wedges. Each outrigger has a leveling jack. In traveling position, the side outriggers are removed and hung by steel straps to the rear outrigger, or are carried separately. Individual right and left wheel assemblies for maneuvering the mount are attached to each side of the base in place of the outriggers.

THE NEW WEAPON

The wheels are of the airplane type with 7.25 x 11.50 plain tread airplane tires inflated to 50 pounds pressure. No system of spring suspension is used. Airplane-type mechanical brakes, operated by a lever and cable, are fitted to each wheel.

Before loading the carriage into a plane, it is necessary to remove the gun barrel and the detachable outriggers. The carriage can be unloaded from the plane and moved for short distances by manpower, or be towed behind any prime mover. Three men can emplace the carriage in approximately five minutes, and can raise it from firing position to traveling position in approximately eight minutes.

Principal characteristics are weight in traveling position, of 3,480 pounds (detachable outriggers and barrel removed). Over-all dimensions in traveling position are: length, 118 inches; width, 56 inches; height, 76 inches. Total weight is 4,495 pounds. Compare these characteristics with those for the standard M2A1 carriage and it is apparent that a major redesigning job was done. Rates of fire are the same as for the M2A1; traverse, 360°, and elevation, from —5° to 90°, are also the same.

On August 2, 1943, the experimental models were standardized as the 40mm Gun Mount, M5, and immediate procurement of 200 was authorized. In a little less than a year a new weapon was designed, tested and standardized.

The development of this weapon is relatively uncomplicated when compared with the steps required to build a new tank. Tanks and other vehicles used by many arms require a much wider coördination. For instance, the Corps of Engineers prescribes definite limitations on the characteristics of vehicles, such as weight and size, which are dictated by the bridges they erect.

Also to be taken into consideration are the facilities for loading and unloading at ports in this country and in the theaters, the capacity of the winches on board ships and their hatches and holds. Railroad and highway bridges and tunnels are also restrictive factors.

The final weapon is a masterpiece of compromise when one considers the various physical limitations imposed on its design and the varied requirements of the different using arms.

MISSION OF THE ORDNANCE DEPARTMENT

The mission of the Ordnance Department is to develop, design, procure, store, maintain for and supply to the Army such equipment and supplies as are assigned to the Ordnance Department for procurement, in such quantities and at such times as are required; and to train and to furnish specialized Ordnance troops as authorized to Zone of the Interior installations and units of the field forces.

The major types of items procured by the Ordnance Department are tanks, self-propelled mounts, motor combat and transport vehicles, artillery and its ammunition, fire control equipment, small arms and their ammunition, bombs, grenades, pyrotechnics, land and submarine mines and their equipment, rocket launchers, and spare parts therefor. In addition, the Ordnance Department will procure other matériel, raw materials, ingredients and facilities, including machine tools and other tools and equipment, necessary for their production and maintenance.

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". . . Misunderstanding of cavalry's value and function might, perhaps, be traced to one of the early tragedies in the First War. The English had not yet learned the new rules of the game and, as is customary with democracies, they were terribly short of men. In one of the desperate attempts to hold back the German army a cavalry regiment was ordered to charge. It was the futile and heroic and impossible effort of the Six Hundred brought up to date. . . . The immediate deduction was: 'Cavalry has no place in modern war.' The truth is, of course, that the cavalry had been misused. In the American Army there have been generals who maintained that fact, in season and out of season, with all the energy that 'Billy' Mitchell gave to his crusade for the flying arm. They have asserted that in modern war the cavalry has as definite a place as the dive-bomber or the tank."—Herbert Corey in *The Army Means Business*.

CARDED

The Gallant Little "L" Plane Had Versatile Uses in World War II

by Charles Villency

THEY were nicknamed "the little planes with the BIG PUNCH" by the Army Air Forces men who knew what these planes could do. These were the "L" planes, the liaison aircraft that were light enough to make maneuverability a minor problem but capable of performing functions which were never found on any activation chart in World War II. Officially their mission was liaison work; actually they were cargo carriers, ambulance planes and even bombers.

Usefulness of the liaison plane was proved during the war in all theaters of operation. Today it maintains its place in the Army Air Forces as a versatile aircraft. A number of new models have been developed since the war, but their function remains generally the same.

For instance, one of the new liaison aircraft, the L-13, has been designed primarily as a liaison and utility plane that will take off or land in a short area with heavy loads. It is an all-metal job of 2,900 pounds gross weight, powered by one 245-horsepower geared Franklin Model XO-425-5 air-cooled engine, and has radio equipment excelling that of any communications and navigational apparatus heretofore put into liaison aircraft.

Normal crew and passenger provisions are for one pilot, one observer and one litter patient. An alternate arrangement will accommodate two litter patients, and a special seating arrangement will allow an overload of one pilot and five passengers.

The cold statistical facts about the "L" plane's construction cannot convey the drama that so often was coupled with their use in World War II. There is many an Air Forces veteran who can truthfully say he owes his life to this small plane.

Back in the days when the Japs were holding on tenaciously to their gains in Burma, the little liaison planes had more than their hour of glory. There's the story of one liaison pilot whose outfit had been operating right under the noses of the Japs for six months, evacuating wounded, carrying supplies, doing reconnaissance and performing a variety of other functions in support of the ground troops who were fighting deep in the jungle country. Assuming that the ground forces could have marched safely to the nearest medical aid station, it would have taken them at least two weeks to batter their way through the jungle. But the liaison planes made the trip in a couple of hours.

It wasn't until the spring of 1943 that the first liaison squadrons went into combat, but that was not their official mission. Actually they were to provide theater and task force headquarters and ground force units with general liaison, messenger and courier service in areas behind the front lines of the enemy troops. They performed these functions and a host of others besides, as AAF historical records show.

The liaison planes performed along lines that were considered impossible. For instance, two 14th Air Force officers actually flew the Hump in liaison planes, a procedure that originally had been frowned on when the question came up as to the best method of moving these planes from India to China. Although they had been told of the difficulties of hopping over the towering Himalayas, Major Fred Welsh and Captain Edward Maher undertook the flight in a pair of L-5s.

They took off from a base in Assam and landed at an advanced field in China. The men reported they got as high as they could—9,000 feet—and made most of the mountain passes. They were forced to drop to 300 feet some of the time, just skimming treetops. And though they had to fly single file through the main pass of the Hump, they got through.

Liaison planes played several rôles in the China-Burma-India Theater of Operations. In Burma, back in 1944, there were two separate light plane operations. One squadron, attached to the 10th Air Force, supported Merrill's Marauders and Chinese-American units in India. Another light plane force operated with the Air Commandos, directed by Colonel Philip Cochran and Colonel John Alison. Activities of this commando unit were in conjunction with operations directed by the late Major General O. C. Wingate of the British Armed Services.

General Wingate attested to the usefulness of the "L" planes with warm words of praise after an operation which saved the lives of many British troops. Surrounded and trapped in the Arakan section in southern Burma, the British troops faced annihilation by the Japs. Many were wounded and had no way of getting out of the jungle fastnesses. Liaison planes received a call for aid. Seven light planes and nine sergeant pilots were dispatched, and in 15 days they evacuated 700 casualties. That mission was considered so important by the British that they provided Spitfire cover for the light planes. However, the liaison planes never had any fighter protection in later operations. General Wingate later told the Americans that "without your men and your aircraft, this campaign could not have hoped to be a success."

The light planes flew into places where larger aircraft feared to operate. A problem otherwise unsurmountable lay in keeping supplies flowing in to the ground troops who were completely isolated in the jungles. Teaming up with C-47 Skytrains, liaison planes accomplished the job. The larger transports flew to the large back bases with a full load of supplies while the light planes distributed this matériel to the small advanced outposts interspersed through the jungle.

Liaison pilots had no snap job, because the Japs knew the value of the small aircraft and did everything to stop them. One pilot got away with 21 holes in his plane. Many times the enemy occupied both ends of the same landing field so as to cut off the liaison planes. Frequently the liaison pilots had to fight the Japs for possession of their planes. On one occasion, the Japs captured some of the liaison planes, so the pilots became ground troops, joined the British and recaptured the aircraft.

Colonel Cochran, hero of the African and Burma campaigns, declared the liaison planes "did one of the finest jobs I have ever seen."

"Our light planes did everything," he said. "They evacuated wounded, served as cargo carriers, transporting everything from barbed wire and bedding rolls to mortars and mortar shells. We used them to help direct our ground activities, to observe enemy movements. A couple of times we made bombers out of them and got excellent results. If we needed to round up the ranking officers from various points in the jungle for important conferences, the light planes did the job."

Three types of planes—the L-1, L-4 and L-5—were used for these operations. Each liaison squadron had seven officer pilots and 32 noncom pilots. In the operations in the CBI and elsewhere, the AAF light plane activities were separate from the use of liaison aircraft by the artillery. AAF liaison squadrons were attached to the various Air Forces where they could be assigned to the ground force units for over-all liaison functions. Their planes were piloted by Air Forces personnel, while artillery liaison planes were flown by artillery personnel and were used only in connection with artillery operations.

An L-5 hugs the mountains in China as it goes out on a mission over the Salween front. It faces dangers from the enemy as well as uncharted mountains.

Air Forces Photo

If skepticism meets the statement that liaison planes could even serve as bombers, here is how it was done: The Commandos in the CBI attached 100-pound bombs to the wings of the L-5 and a 250-pound bomb to the belly of the L-1 (in late 1944 this plane was no longer in production), and bombed the enemy from low altitudes. On one occasion, a force of Japs took cover under a bridge and fought a strong delaying action from their protected position. Two men took off in an L-5, equipped themselves with hand grenades, swept down on the top of the bridge and tossed their grenades out of the doors at the enemy under the bridge.

The liaison planes did yeoman work in reconnaissance. They worked in close coördination with advancing ground forces by reconnoitering the terrain and dropping notes to the advancing columns with information concerning the Japs' strength and position. Light planes kept a close and constant watch on all trails leading into the landing strips to detect existence of any enemy patrols. Light planes also were used to spot targets for bombers. One man sat in back of an L-5 with smoke bombs which he tossed overboard when the plane flew in at zero altitude. The heavy aircraft then bombed on the smoke.

Evacuation of wounded forms part of the proud record of the light aircraft. While the L-1 and L-5 normally carried only two men each, in response to an emergency situation it was not unusual for the L-5 to carry three and the L-1, four passengers. Sometimes the L-1 even carried five men. There was no other way to bring out the wounded from the jungle, Colonel Alison reported at the time.

"The men were very glad to sacrifice comfort for safety," he said. "A wounded man behind enemy territory is a worried man. The knowledge that the light planes were evacuating the casualties was a great help to general morale."

Although the official specifications of the L-5 indicated it was built to carry about 250 pounds of cargo, actually the normal load was often twice that. The liaison planes carried supplies attached to each wing and, when no landing fields were available, dropped the matériel to the troops below by parachute.

The "little planes with the BIG PUNCH" accomplished their missions and more. The pilots who flew them are proud to have taken part in such gallant performances.

MEDICAL DEPARTMENT

CARDED

Medical Care in Combat★

THE Army Medical Department watches over the health of the soldier from the time he is inducted until he is discharged. An outstanding example of this care is the treatment the wounded soldier receives during combat. Here treatment and evacuation combine into a near-perfect medical service organization and may best be understood by following an injured soldier through the "normal" chain of evacuation.

Medical treatment begins as soon as the soldier becomes a casualty. Many a soldier has stated that he received medical care within minutes after he was wounded. From that point on, his evacuation may be compared to a medical conveyor belt.

Every soldier is trained in the principles of first aid and carries with him in battle the things he may need in such emergency. If his injury is too serious for him to help himself, medical aid men are there to give him first aid where he falls and litter bearers carry him to the battalion aid station located a few hundred yards from the front lines for emergency surgery and medical care. These aid stations are usually located so that they can be reached by following the "lines of drift," by some means of markers either natural or improvised and move to new positions each time fighters advance.

Here the first real medical attention is given by the Battalion Aid Surgeons and their assistants. Supplementing the first aid given by the medical aid man, any bleeding is stopped, dressings and splints are applied, pain is relieved by morphine, and shock is counteracted by plasma and whole blood, as well as opiate. Plasma is used in the treatment of shock to render the casualty transportable and help preserve life until a hospital can be reached; whole blood is given to prepare the man to withstand life-saving surgical procedures. At the battalion aid station the decision is made whether the wounded man should be returned to combat or moved on along the chain of evacuation by ambulance, jeep or litter to the collecting station which may be a few hundred to several thousand yards from the front. This also is only a stopping point where the wounded are sorted into groups that will return to combat and those who will be sent on for more care. Since collecting stations are close to the zone of battle, they take care of both walking and transported wounded. They maintain contact with all division battalion aid stations; their primary objective being to prepare the wounded for transportation to more permanent Medical Department units.

The next stop for the wounded requiring further medical care is the clearing station. These are well-equipped but temporary installations under tentage, serving one division and beyond the immediate fighting area. They have complete surgical equipment, electricity, and full kitchen facilities. Here emergency surgery and treatment is given and the wounded are classified according to type of injury. The wounded soldier remains here for several days, if necessary, until he can be moved again—either back to combat or prepared for transportation to the evacuation hospital. Clearing stations usually are operated in pairs so they can leapfrog to keep up with advancing troops. Each is staffed by 12 doctors and 96 enlisted men and generally consists of 12 tents in a unit.

Set up as near the front as practicable is the evacuation hospital. It is generally found some 12 to 15 miles to the rear and in some cases as far as 50 miles. These are semi-fixed installations usually set up in a school or some other suitable building accessible to auto roads and

A medical aid man tapes up a wounded soldier. Four aid men carried this soldier more than a mile through thick jungle before he could be put aboard a Jeep.

Signal Corps Photo

★From Surgeon General's Office.

airfields. They provide facilities for major medical and surgical treatment of all casualties. In terrain where no buildings are available, these evacuation hospitals also may be under canvas. In this event they are large tents housing from 40 to 60 cots each, and are provided with all the equipment of a modern hospital. A 750-bed hospital of this type is generally staffed by 47 medical officers, one warrant officer, 52 nurses, and 308 enlisted men.

Evacuation hospitals are outstanding examples of the efficiency of organization. So minutely planned are the logistics involved that, upon occasion, these fully equipped, modern medical installations have risen upon barren fields within a matter of minutes. Several instances were reported in ETO of hospitals set up ahead of their Division so that the first men hit by enemy fire found ready and waiting the best medical and surgical skill available anywhere with X-ray and other equipment permitting the most delicate of surgery to be performed immediately.

At the evacuation hospital initial wound surgery is performed. In this stage of treatment the main objective is to prevent infection. The operation termed "debridement" is performed which removes all tissues devitalized and prepares the way for the prompt and successful institution of the secondary or reparative phase of surgery which follows at the base hospital to which the man is removed.

From the evacuation hospital the man may be sent to one of several hospitals, depending upon his condition —convalescent or general hospitals within the theater or the general hospital in the United States.

General hospitals, both overseas and in this country, are fixed installations providing general medical and surgical care. Here the wounded man receives reconstructive surgery, the third and final phase of his surgical care. The commanding general of each theater of operations decides the maximum length of time a man can remain in hospitals in his zone; it may be 30 to 90 days, or more. Men requiring longer care, and those declared unable to perform further duties are evacuated to the United States.

A wounded soldier who continues in this chain of evacuation from the battle front goes from the general or base hospital overseas to an embarkation hospital, and from there is moved by hospital ship or hospital plane to the United States. The hospital ships with an average capacity of 500 patients are complete floating hospitals staffed by about 12 medical officers, 35 nurses, and about 100 enlisted personnel. The planes carried about 24 litter patients, and shuttled back and forth between overseas theaters and this country.

The wounded are landed at debarkation hospitals where they remain only long enough to be routed by plane or hospital train to the appropriate general hospital which specializes in the treatment the individual case requires; the secondary effort being to send each man as far as possible to the hospital nearest his home so that he may be visited by his relatives and friends. Here the wounded man remains until he has received the maximum of medical and surgical treatment going on to the convalescent hospital for that phase of his care. From here the man is eventually recovered sufficiently to be returned to duty or discharged to civilian life.

Signal Corps Photo

Ninth Army aid men give assistance to German prisoner shot in the stomach.

All along the line of this medical conveyor belt the soldier has received treatment. His spirit has been developed and he has put his dependence on the doctors and nurses. He has seen others with possibly more serious wounds get well. He learns to take the loss of an arm, leg, eye or disfigurement in his stride. He believes he will soon be well to do a job and has complete confidence in the doctors and nurses and that he is given the best care that medical science can provide. That this confidence is not misplaced is shown by the fact that almost ninety-six out of every 100 wounded who reached hospitals survived. This record has been accomplished by a vigilant, aggressive medical policy which has resulted in the advancement of medical science by many years. Many of these new methods of medical and surgical treatment have already been passed on to the public.

Marine Tank Lessons Learned at Guadalcanal, Bougainville and Tarawa

by John L. Zimmerman and Joel D. Thacker*

Early in the war against the Japs the U.S. Marines learned the importance of mutual support by infantry and tanks. But, they had to learn this important fact the hard way at Guadalcanal.

TANKS were an organic part of the first United States Marine Corps unit to go overseas after the outbreak of war with Japan. The First Marine Division, which landed in New Zealand in the midsummer of 1942, was equipped with five companies of light tanks —the M-3. These tanks actually saw action the second day of the Guadalcanal campaign.

The Marines' first lesson in the use of tanks in the Pacific was learned in the bitter initial fighting of the Guadalcanal campaign on the small islands of Gavutu and Tanambogo, twin islets joined by sort of a causeway, just off the shore of Tulagi. Here, well emplaced, competent enemy troops offered determined resistance to the attacking Marines of the First Parachute Battalion and the Second Marines. Two tanks were assigned to help out the assault.

It was at this point that the importance of close mutual support by infantry and tanks was learned. One of the two tanks had allowed itself to get too far ahead of the troops. It was attacked and burned with ease by the Japs. The other tank operated with its supporting infantry, delivered valuable support in its turn and withdrew successfully.

Ilu, first known as the Battle of the Tenaru, was the next action in which Marine tanks took an important part. It was here that the first great Jap assault on the American perimeter was launched. After a momentary success the Jap attack was stopped and hurled back. The attack had been launched across the sand bar at the mouth of the Ilu River. After being repulsed the enemy had returned to the right bank of the river. The Japs were concentrated in a small area, triangular in shape, bound on one side by the lagoon-like river and on the other by the sea. The area was also heavily overgrown with brush and cocoanut palms. Reports indicated that this force was well equipped with artillery and modern weapons capable of inflicting heavy damage on a light tank.

A platoon of tanks was sent across the sand bar into the enemy concentration to increase the confusion among the Japs, which presumptively had come upon them when they were thrown back with heavy casualties. Two of the tanks were disabled, one by means of a mine, but the crews were rescued. No statement was made in the Final Action Report, whence these details come, as to the effectiveness of the sortie.

The second big attack upon the American perimeter was launched from inland against the southern sector, along a ridge. Coincidentally with the main attack a smaller action was fought on the right flank of the American positions in which both forces faced each other across an open plain, a flat stretch of land had been burned clear by the defenders for the sake of better observation. Each force occupied woodland bordering upon the field. Estimates of the enemy force were about one battalion with artillery. Official account of tank participation in this action follows:

"Tanks were employed against the position, at first with some success. However, the mistake was made in attempting repeated sorties along the same route. Enemy anti-tank weapons were soon put into position and a subsequent sortie was met with close-range fire which destroyed three tanks."

Two things were realized at this point in the operation. First, there was the explicit realization that the light tank was an inadequate weapon, that its fire power and its protective armor were insufficient for the tasks normally assigned to tanks. Secondly, there was a growing idea that in terrain of the type in which the actions were taking place, the usefulness of the tank was, and would continue to be, severely limited.

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*Historian, USMC.

These two ideas were made explicit in the recommendations submitted at the close of the campaign, and which follow:

"Tanks were employed with some success on two occasions. An analysis of these actions indicated:

1. That the jungle is generally unfavorable for tank action.
2. That tanks in small numbers can operate effectively in areas occupied by cocoanut plantations.
3. That the tanks must operate at slow speed and with extremely close infantry support.
4. That wherever possible medium tanks should be employed because of the extreme vulnerability of the light models."

The second large operation of the Marine Corps was that of Bougainville, and here, as in Guadalcanal, a type of terrain was encountered that proved to be the worst possible for the employment of tanks. The participation in action by tanks was limited almost entirely to the task of perimeter defense. Here also, as in Guadalcanal, only light tanks were employed, although the Third Marine Division tank unit—the Third Tank Battalion—included one company of medium tanks, model M4A2. There is no record that this company ever went ashore.

The first action in which it might be said that tanks played an important part and operated in accordance with tank doctrine was the short and violent Betio assault by the Second Marine Division. By this time the division had been equipped with one company of medium tanks from the First Marine Amphibious Corps, who send Company C of the Corps Tank Battalion to New Zealand in October, 1943, for attachment to the Second Division.

The details of the assault on the small, low island are well known. The terrain was more suitable to tank participation than had been that of the Solomon Islands, and the type of defenses which the enemy employed was that against which it was hoped that tanks would be effective.

The two terrain features which caused great difficulties to the infantry likewise proved to be an impediment in bringing tanks into action. The reef which extended roughly parallel to the shore along the landing beaches precluded the possibility of getting the LCD's near the beach proper. It was necessary for crew men to disembark at the reef, wade ashore over the partly submerged coral shelf, and pick out a path that could be followed by the tanks. During this stage of the operation one tank was lost as a result of falling into a hole in the coral.

It will be remembered that along almost the entire beach there had been built a sea wall several feet high, strongly constructed of cocoanut logs. The distance between this wall and the water's edge was only a few feet, and the infantry was, for a time, pinned down in the narrow strip by fire from enemy emplacements inland. There was, at all times, congestion on the beach.

The tanks, once ashore, could not immediately get inland, since the sea wall extended without a break along the beaches where they landed. A means of ingress was provided when a demolition charge blasted out an opening in the wall beyond a point of land on the extreme right of the positions.

Here a difficult decision had to be made by the commanding officer of the company. In order to approach the opening the tanks would have to use one of two paths. The more desirable route lay along the beach under the sea wall, but practically the entire length of the beach was crowded with combat troops, some of whom were wounded. The less desirable route lay through the water and along the uneven partially submerged coral shelf parallel to the beach line, and it was this route that he finally selected. In making the trip, three tanks fell into submerged shell holes, and of the three, only one was salvaged.

Two medium tanks got onto the island and began working inland with the infantry who stayed in close support some fifty yards to the rear. After making some progress, both these tanks became casualties, although only one was totally destroyed. An anti-boat gun damaged the traversing mechanism of one tank, which thereupon made its way back to the beach and set up as a beach defense weapon. Fire from an enemy tank burned the second one completely. One tank of the original group of six was salvaged during the first night and went into action again on the second day.

In the meanwhile, another group of eight tanks landed on the opposite end of the landing beaches, and here again one tank was lost in a submerged shell hole on the coral shelf. The remaining seven found a break in the sea wall and succeeded in getting onto the island, where they supported the advance of the infantry and worked against enemy strongpoints.

The fact that the entire battle took place within a severely limited area and that it was a bitterly contested fight wherein at times the lines were poorly defined makes it understandable that two tanks at least were damaged by friendly fire. A medium tank, in its first advance after getting onto the island, was disabled by friendly mortar fire while later in the fight a second tank was damaged by friendly dive bombers.

Recommendations made at the close of the operation confirmed those made nearly a year earlier at the end of the Guadalcanal campaign. The light tank was once more found to be inadequate both as to armor and armament, and the necessity for even closer coöperation between the tank and the infantry was stressed. It was recommended that one light tank per platoon be equipped as a flamethrower.

TRANSPORTATION CORPS

CARDED

Army Transportation Corps

by Lieutenant Colonel Russell F. Oakes★

THE Chief of Transportation is the head of the Transportation Corps and as such is chief transportation officer of the Army and Traffic Manager for the War Department and is responsible for directing, coordinating and supervising all transportation functions for the War Department and for operating such field activities pertaining to these functions as may be assigned to his command by the War Department. The Chief of Transportation is a technical staff officer of the War Department. . . .”

Following the prosaic pattern so characteristic of its official documents, the Army thus capsules its description of the Office of its Chief of Transportation. There is no hint of the toil and trouble, the blood and sweat, the pioneering, ingenuity and resourcefulness, the imagination and determination, the breadth and scope of activities and operations that entered into the discharge of his responsibilities and the accomplishment of his mission during World War II. Nor is there more than a hint, and that imperceptible to all but the initiate, of intricacies and complexities inherent in peacetime responsibilities and activities.

The Transportation Corps is, of course, the Service arm commanded by the Chief of Transportation, and the agency with which and through which he accomplishes his many-faceted mission and his myriad responsibilities. Its peak wartime strength was 403,000, of which nearly 300,000 were military and slightly more than 100,000 civilian men and women. Its current strength, less non-Table of Organization personnel assigned to installations, and to staffs of Armies and Theaters outside the jurisdiction of the Chief of Transportation, is 65,238 military and 44,493 civilian for a total of 109,731.

The Chief of Transportation is coördinator for the War Department with the Office of Commissioner of Customs on all matters of War Department interest, and he is the delegated agent of the Secretary of War for the administration and supervision of all marine personnel affairs of the War Department.

This youngest of the Army Corps was born on July 31, 1942, out of a General Staff decision that full and complete coördination and integration within the Army of all highway, marine and rail transportation activities was fundamental to the successful prosecution of the war. That this decision, translated into policy out of which the Transportation Corps was set up as an “emergency agency,” was soundly conceived is illustrated by Paragraph X of War Department Circular No. 227, dated July 30, 1946:

“TRANSPORTATION CORPS. For information of all concerned, it is announced that on February 6, 1946, the Chief of Staff approved the continuance of the Transportation Corps as a part of the permanent Military Establishment. At the appropriate time the War Department will seek the implementing authority necessary to accomplish the establishment of a permanent Transportation Corps.”

Illustrative of the continuing efforts of the Army to better coördinate and integrate its highway, marine and rail transportation activities is the transfer, announced as recently as August 9, of functions encompassing administration and operation of all general purpose automotive equipment from the Quartermaster Corps to the Transportation Corps.

Among the types of units affected by the transfer are:

Transportation Corps Truck Company (Heavy), formerly the Quartermaster Truck Company (Heavy). This type of unit operates large truck-tractor and trailer combinations capable of hauling all classes of Army supplies.

Transportation Corps Truck Company (Troop), formerly known as Quartermaster Truck Company (Light) or Quartermaster Troop Transport Company. Equipment employed by this unit consists of trucks commonly known as two-and-one-half-ton, capable of moving supplies, equipment and personnel in smaller quantities and numbers than the tractor-trailer combinations.

Transportation Corps Car Company, formerly known as Quartermaster Car Company, equipped to provide passenger transportation for military personnel.

Specialized automotive equipment peculiar to its own responsibilities and functions, among them mobile bakery, shoe repair, textile repair, fumigating-and-bath, laundry and refrigerator units, remains with the Quartermaster Corps.

The War Department General Order establishing the Transportation Corps came eight months after Pearl Harbor. To the Chief of Transportation it presented the seemingly insuperable task of creating, training and managing an organization destined to embrace more than 400,000 personnel while actually designing, building, increasing and speeding all types of military transportation under his jurisdiction and utilizing to the fullest extent all commercial transportation in his field to bring to bear upon the enemy on distant battlefields

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★Transportation Corps.

the full force of America's military might. Out of this congerie of responsibilities and challenges, and aided by few, if any, fortuitous circumstances, sprang the largest integrated transportation system in the world.

To delineate the accomplishments of the Transportation Corps would require volumes. But presentation of at least a few highlights is necessary to comprehension of its place in and importance to Allied victory and future security. They are:

TROOP MOVEMENTS (Zone of Interior)

a. 40,541,261 troops moved by rail and 1,144,399 by bus in organized groups of 40 or more. (December 1941 through July 1946.)

FREIGHT SHIPMENTS (Zone of Interior)

a. 349,071,700 short tons of Army freight shipped via rail, highway and water carrier. (December 1941 through July 1946.)

EMERGENCY CONTROL OF UNITED STATES RAILROADS

a. Assumed control, under the direction of the Secretary of War and the Commanding General, Army Service Forces, of all the railroads of the country at the time of the railroad labor crisis of December 1943 and turned them back to private management in January 1944 without any interruption of operations having occurred and without any financial involvement of the United States.

OCEAN TRANSPORTATION:

a. 8,420,197 troops and other passengers embarked from American ports. (December 1941 through July 1946.)

b. 7,417,001 troops and other passengers returned to the United States. (December 1941 through July 1946.)

THEATERS OF OPERATION:

1. Successfully met all intra-theater transportation requirements of theater commanders.
2. Operated 65 overseas ports of embarkation and debarkation.
3. Military Railway Service (TC) operated 30,000 miles of military railroads, a large part of which (especially in Europe) had to be completely rebuilt and rehabilitated.
4. Operated 46,500 trucks in Motor Transport Service.
5. Operated the famed Red Ball, ABC and XYZ highway express routes to deliver to the front 1,924,006 long tons of supplies.

While these statistics point up the record and provide a clear conception of the Transportation Corps' complex and varied activities and responsibilities; while they explain in a way the fierce pride TC men take in their organization and in their accomplishments, they give little indication of the valor and the heroism that entered into their achievements. They fail to tell of the Port Battalions, the Military Railway Service and other TC troops who left their engines, their cranes, their slings, their hatches and their hoists to pick up rifles or carbines and join Ground Force troops in standing off enemy attacks; they tell nothing of the Negro DUKW operators at Iwo Jima who amazed even the doughty Marines by ignoring withering bombardment in order to maintain a flow of supplies to hard-pressed Leathernecks ashore; nor do they tell of the operation of ports under "buzzbomb" attacks, and of Harbor Craft troops in snub-nosed tugs showing the way to the invasion of the Continent over Omaha and Utah beaches. That glory—and much more—belongs to the men of the Transportation Corps.

But it is the transition from war to peace, and peacetime planning, which now engage the Transportation Corps. Naturally, it is employing means proved wise in war to shape its peacetime ends. The evolution of events already has resulted in the streamlining of both organization and procedures. Installations, among them four Ports of Embarkation which were of major importance during the war; nine Transportation Zones; Holding and Reconsignment Points and other installations superfluous to peacetime needs, have been closed out. The Zones have merged with the Army's field organizations, with each Army commander having on his staff a group of Transportation Officers. Economy consistent with efficient operations, and with progress, has become a "must."

Two major goals constitute the objective toward which this new Corps strives: 1. Provision of efficient transportation service to the peacetime Army and, 2. Creation of superior efficiency in its fields and readiness to meet any emergency of peace or of war. The second of these, of course, embraces the first, but it encompasses much more—"preparedness."

Preparedness in military transportation means creation through aggressive study, research, experiment, education, ingenuity, industry and training of new and better means and methods of moving men and material. It means close coöperation and coördination

Freight cars of the Army Transoprtation Corps pour from the open bow of an LST onto a rail track in France.

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between the Transportation Corps and the industries engaged in transportation and the production of transportation equipment; close coördination and coöperation between the Corps and all other Government Agencies, and agencies of Allied Nations, dealing with transportation. It calls for the addition of courses in transportation to the curricula of many schools and colleges, and the provision of extension courses for the Transportation Corps Reserve. And it demands perpetuation of the alertness to responsibility that was so characteristic of TC forces during the war.

It is to the accomplishment of these ends that the Transportation Corps has dedicated itself. Already, through its Research and Development Division, its Transportation Corps Board and the Transportation Corps Technical Advisory Board, which is a handpicked, representative group of leaders in the nation's transportation industries, it is busy examining every last detail of all captured enemy transportation equipment, and delving into records of enemy transportation methods and procedures. It has sponsored and is very actively assisting experiments with new applications of cycloidal propulsion. In another direction, it is working in coöperation with leading shipbuilders toward perfection of marine electro-coatings developed by one of its officers during the war to 90 per cent effectiveness in protecting a ship's hull from rust and other corrosives; and toward perfection of an electrolytic cleaning process, developed by the same officer, which is expected to outmode "chipping." Perfection of these methods would be of vast economic significance to commercial as well as to military shipping.

The Transportation Corps has developed a far-sighted and long-reaching program of education and training, which includes establishment of the Transportation Center at Fort Eustis, Virginia. Here it will provide comprehensive training for enlisted men in more than 90 different skills, ranging from Diesel mechanic to marine engineer, from boatswain to locomotive engineer, from electric locomotive repairman to marine diver, and from armorer to amphibian truck driver. In addition, Fort Eustis, which will have complete facilities for the thorough training of all TC personnel, will offer a course for camp, post and station transportation officers.

The education and training program for regular officers envisions within their first year of service, a three-month basic course at Fort Benning, Ga., and a basic branch course of five months at Fort Eustis. An associate branch course of three months also will be offered at Eustis for graduates of Officer Candidate School, Reserve and National Guard officers, officers from other services and foreign nationals. There will be a Regular Advanced Technical Course of 10 months for officers with from three to 10 years service, with an associate course of three months for Reserve, National Guard and Transportation officers, and for officers from other services. The over-all program continues for eligible officers through the Command and General Staff School, the Armed Forces College, the Industrial College and the National War College. A transportation course also is to be offered at the Air College. At this writing, eight leading American colleges and universities have agreed to take eligible officers for graduate and/or postgraduate work in transportation subjects.

The Corps' ROTC program contemplates the activation of from 30 to 35 units of 250 men each. Of these, perhaps seven will be activated this fall. Under War Department policies presently in vogue, the ROTC units would study the transportation course, of 160 hours per year, in their junior and senior years.

Nearing completion in the educational and training program are arrangements for extension-course instruction to Transportation Corps Reserve personnel. One out of every two officers in the A.U.S. who served with the Transportation Corps in World War II and who is now being relieved from active duty, is applying for a commission in the newly organized Transportation Corps Reserve. A surprisingly large number of these officers already are displaying eagerness to enroll in the proposed extension-course instruction.

The Transportation Corps has accepted the challenges to its ingenuity and determination implicit in its peacetime mission and responsibilities as eagerly as it accepted those imposed by war. It faces them with the same fresh vigor and vitality that carried it over many an "insurmountable" obstacle placed in its path by desperate and deadly enemy nations; with the same flaming faith in its abilities that made its troops certain during the war that if called upon to do so they could move mountains. It is determined that, military-wise, its superiority shall be unquestioned, and that its developments and progress shall be devoted to the common peacetime interests of the nation rather than exclusively to preparedness for war.

The Chief of Transportation is a technical staff officer of the War Department and commands the Transportation Corps. In these capacities he:

1. Renders technical and administrative advice and recommendations to the Secretary of War, Chief of Staff and the War Department General and Special Staffs.
2. Prepares plans, estimates, and orders affecting transportation matters or the Transportation Corps, in order to relieve the War Department General and Special Staffs of such routine duties.
3. Coördinates with the War Department General and Special Staffs with regard to their operational, administrative and technical plans and activities.
4. Exercises such Army-wide technical supervision of transportation activities and inspections in connection therewith as the Chief of Staff may prescribe.
5. Commands all troops and activities or services assigned to his command by the War Department and exercises the usual functions of command over such troops and activities and services.

6. Prepares plans for the transportation requirements of the War Department and advices the Director, Services, Supply and Procurement, WDSS, with respect to transportation problems.

7. Represents the War Department in obtaining allocations of shipping from the War Shipping Administration and from the Combined Shipping Adjustment Board, or such other similar organizations as may exist.

8. Directs the application of shipping available to the War Department to meet the requirements of the Army and the United States Military missions aboard.

9. Prepares and disseminates information regarding the status of troop and freight movements, location of ships, ship movements, and ship and cargo losses pertaining to the Army.

10. Maintains liaison for the War Department and negotiates with surface commercial carriers, including the railway industry, the commercial motor transportation industry, the commercial shipping industry, including inland waterways and the Great Lakes shipping industries, the Office of Defense Transportation, and other U. S. Government agencies on all matters of surface transportation, including rates, classifications, agreements, and conditions of handling all movements of War Department personnel, freight and cargo.

11. Prepares the budgetary requirements for the movement of War Department freight and exercises staff supervision over the expenditure of these funds to insure the most efficient and economical use thereof.

12. Establishes the policies and procedures for the operation of the Army ports of embarkation to include those pertaining to direction and coördination of shipping procedures and warehousing and storage functions.

13. Exercises staff supervision and control over the assignment and maintenance of all War Department floating equipment, except stream-crossing equipment and that required for river, harbor, and fortification work under the Chief of Engineers, and rescue boats under the control of the Commanding General, Army Air Forces.

14. Designs, procures, and purchases (including inspection) floating equipment for the War Department, except: stream-crossing equipment, and vessels and floating equipment required for river, harbor, and fortification work under the Chief of Engineers, and the design of rescue boats of the Army Air Forces.

15. Designs, procures, and purchases rail equipment for the War Department.

16. Procures specialized pier and ship cargo-handling equipment for the Transportation Corps.

17. Exercises technical staff supervision over the operation of all utility railroads and over the allocation, maintenance, repair, and economical use of all railroad equipment of the War Department.

18. Exercises staff coördination and control over movements of troops and other War Department passengers and all War Department-owned and controlled freight and cargo within the Zone of the Interior by commercial motor, rail, water, and air (non-contractual) and to and from overseas theaters by water and by civil air (non-contractual).

19. Issues releases under a block system to regulate the movement to ports of Army cargo for export.

20. Routes all War Department freight of one or more cars and/or the equivalent of one carload or more (as usually loaded) if moved by truck, and all inland movements of troops in groups of fifteen (15) or more.

21. Computes freight rates for procurement officers in the field.

22. Operates the War Department fleet of railroad tank cars.

23. Exercises staff control over the operation of Army Reservation Bureaus.

24. Makes basic determinations of requirements for administrative and L of C (Line of Communication) cargo and personnel vehicles, Transportation Corps truck units and related equipment to meet the needs of the War Department.

25. Exercises staff control over the allocation and utilization of administrative vehicles (as defined in WD Circular 139, 1945) and first and second echelon maintenance thereof, except for the Army Air Forces.

26. Provides the War Department with traffic and transportation engineering service (except air), including the determination of foreign and domestic transportation capabilities and requirements.

27. Formulates plans, policies, and technical methods governing the training of personnel engaged in transportation activities, except air, and except those assigned by the War Department to other commands for supervision.

28. Commands and operates ports of embarkation, the Transportation Corps Board, Transportation Corps Supply Depot, Transportation Corps Railroad Repair Shops, and the Transportation Training Center.

Transportation Corps trucks are taking supplies from freight cars operated by TC Military Railway Service units in a town near Frankfurt, Germany.

TANK AND ANTITANK★

by Brigadier R. M. P. Carver

> **"In the battle of El Alamein, in 1942, on which Rommel pinned his hopes of reaching Alexandria, we had available approximately 200 Grants, 100 Crusaders, 100 Stuarts and 100 Valentines. . . . Rommel employed about 300 German tanks, almost all Mark IIIs and IVs, mostly the latter. The latest improvement on his side was the Mark IV Special, equipped with the long 75mm (Kwk-40), designed as an antitank gun and superior to the 75mm in the Grant, and the 6-pounder. . . . This time there was no surprise; he had little space to maneuver and we were well ensconced in an excellent battle position. He ran his head right into it and our 75mms and 6-pounders took heavy toll, though we realized that the Mark IV Special was a tank to be reckoned with."**

THE present seems to be an appropriate time at which to review the development of tanks, Allied and Axis, during the war and of the antitank weapons produced by either side. It is an interesting story, the truth of which has been distorted by controversy and ignorance. One major cause of misunderstanding has been the claim to have produced a weapon which to the soldier is useless until not only has he received it in the field in sufficient numbers to replace its predecessor, but has also been trained in its use, and has with it the accessories and behind it the spares necessary to maintain it. It was, I think, Mr. Duff Cooper, then Secretary of State for War, who in 1935 said that we had the best antitank gun in the world. He was alluding to the two-pounder. If there were any fit to fire at that time, they were not outside the experimental ranges. In the Middle East, then the threatened theater of war, they were not in service until the end of 1940. Misleading statements of that kind are the cause of controversy which has confused the issue on countless occasions.

FRANCE, 1940. In 1940 when Germany attacked the Low Countries, we had the following tanks in service:

Matilda, Mark I. A three-man I tank mounting a 2-pounder and co-axial .303 Vickers machine gun. Well armored for its day with 75mm but very slow, underpowered, unreliable and with a very short range. Not more than about 60 of these. No spares.

Cruiser, A.9. Forerunner of the Valentine: originally designed by the late Sir John Carden before his death in 1936. Crew of six. Armor about 14mm. One 2-pounder gun and three .303 Vickers machine guns. Range about 100 miles. Speed 20-25 m.p.h. Unreliable on account of track defects. No spares and often not the full complement of weapons. Nevertheless the best tank in the service of either the British or the French. About 100 of these.

*Light Tank, Mark VI, VI-*B *or VI-*C. Crew of three. Armament one .5-inch and one .303-inch Vickers machine gun. Armor 14mm. Very poor cross-country capacity. 35-40 m.p.h. on roads. Reliable, having been in service since 1935. Range about 100 miles. Purely a

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★Journal, Royal United Service Institution.

reconnaissance vehicle, but provided in fact the equipment of the vast majority of tank units.

In the same campaign the Germans used the following types of tank:

Pz-kw, Mark I. A light tank inferior to our own in armament, having only two 7.92mm machine guns. Armor 14mm, equal to our own. Cross-country capacity slightly better. Crew of three.

Pz-kw, Mark II. An improved light tank, carrying one 20mm and one 7.92mm machine gun. Armor 15mm. Better cross-country capacity. Still really only a reconnaissance vehicle. Crew of three.

Pz-kw, Mark III. Cruiser-type tank. Originally carried one 37mm gun, equivalent to our 2-pounder and two machine guns. In the spring of 1941 it certainly had a 50mm gun. I do not know whether in 1940 any were equipped with 50mm guns. Armor 30mm. Crew of four. Good cross-country capacity and reliable.

As far as quality went, therefore, we would appear to have been pretty well on a level with the Germans, though our Cruiser was thinner than their Mark III. In quantity we were hopelessly at a disadvantage. Light tanks were the only ones available in any quantity. The Matildas were handicapped by their reliance on transporters for any major move. The only transporters available were railway flats, which were immobilized by the German Air Force. Wherever they fought German tanks they were successful, until overcome by weight of numbers and outmaneuvered as a result of their slow speed, short range and unreliability.

As far as weapons to deal with German tanks were concerned, quantity and inferior armor-piercing ammunition were the main disadvantages. The 2-pounder, whether in the tank or on a ground mounting, would knock out the German Mark I or Mark II at ranges up to 1,000 yards, and the Mark III up to 500 yards, if not slightly more. The Boyes antitank rifle and the Vickers .5-inch machine gun would penetrate the Mark I or Mark II at a range of about 400 yards, but were useless against the Mark III. The German 37mm antitank gun was equivalent to our 2-pounder and could knock out the Cruiser at about 500 yards, the Light Tank at 1,000, but made no impression on the Matilda. The 50mm antitank gun would knock out the Cruiser at 2,000 and the Matilda at about 800 yards.

Generally speaking, therefore, in this campaign it was quantity rather than quality in both tanks and antitank guns which was our chief disadvantage, though in the 50mm antitank gun the Germans were a considerable step ahead. I am not certain that they did in fact have them in this campaign; if they did, it was not in very great numbers, the 37mm being still their standard tank and antitank gun. In armor the Mark III was twice as thick as the A-9, but less than half as thick as the Matilda.

LIBYA, 1940-1941. At the beginning of the campaign against Italy in June, 1940, we had in Egypt approximately the following numbers and types of tank:

Cruisers, A-9 and A-10. About 60. Many of these, however, were without their 2-pounder and at least one machine gun. Much other necessary equipment, such as sighting telescopes and wireless sets, was also "to follow." There was a complete lack of spares. They were not subject in the desert to the track trouble experienced in France and were generally fairly reliable, after original cooling and air-cleaning troubles had been solved. The A-10 was substantially the same as the A-9 with two instead of three machine guns, and armor of 30mm instead of 14mm.

Lights, Mark VI, VI-B or VI-C. About 200, of which not more than 160 were in the field. Reliable apart from track trouble, which depended for its solution on a vast reserve of locally-made track pins.

The only Italian tanks up to February, 1941, were the Mark XI, a poorly armored unreliable Cruiser mounting a 37mm gun, of which there were very few, and the C.V-3 which could hardly be called a tank at all, a miniature machine-gun carrier which was little more than a death trap. As far as both quantity and quality went, therefore, we were definitely superior. For antitank guns we had two batteries of 37mm Bofors; their chief disadvantage lay in the fact that the ammunition for them was made in Poland and, therefore, once we had fired off what we had, the guns were useless. There were also some 2-pounders in the support company of the 1st Royal Northumberland Fusiliers at Mersa Matruh. In reserve were the old prewar medium tanks of 6th Royal Tanks, some dug in in the defenses of Matruh and some manned by the Egyptian Frontier Force in Siwa!

In October, 1940, the scale was turned even further in our favor by the arrival of the 7th Royal Tanks with some 50 Matilda Mark IIs, a great improvement on the Mark I, though with the same gun and armor; the 2d Royal tanks with 50 to 60 Cruiser A-13s and the 3d Hussars with 60 Light Tanks. The A-13 was the first Cruiser with Christie-type suspension, the pilot models of which had been made by Nuffields in 1936. In speed it was a great improvement on the A-9 and A-10, but had only 14mm armor and the same armament.

At the start of the offensive on December 8, 1940, we had in the field the following tanks:

Matilda Mark II, 50; Cruisers A-9, A-10 and A-13, about 170; Lights, about 160.

The Italians never produced more than about 100 M-11s, and always in such scattered groups that they were never a problem at all. For antitank guns we had more 2-pounders, which had replaced the 37mm.

The Matilda was "Queen" of the battlefield. The only things which could stop it were a mine or a direct hit by a field gun at short range. The real problem of the campaign was maintenance. By the time we reached Tobruk, tank strength had fallen to 16 Matildas, 50 Cruisers and 50 Lights. Only a small proportion of the losses were battle casualties. For the final battle of Beda

Fomm on February 8, 1941, the enemy produced about 40 new M-13s, a much improved Diesel-engined Cruiser with a 37mm gun. As, however, he only had scratch crews, who had snatched the tanks straight from the dockside in Benghazi, and as they were Italians, they proved little trouble to us. After the battle of Beda Fomm it was found that only 12 Cruisers and 40 Light Tanks fit for a farther 100 miles could be produced. By that time the 2d Armored Division had arrived, bringing, apart from what went to Greece, some 60 A-13 Cruisers and 60 Lights, the latter being kept at the base for reinforcements.

When Rommel attacked from Agheila in April, 1941, with his 5th Light Panzer Division, made up of Mark IIs and Mark IIIs, he was faced by the 3d Hussars with about 40 Lights and the 6th Royal Tanks with about 40 Italian M-13s. The 5th Royal Tanks with about 50 Cruisers, which had not been new when they left England, were in GHQ reserve at Tobruk. They were ordered up in a great hurry, too late. Many broke down and more ran out of petrol, with the result that they hardly affected the battle at all. Meanwhile mixed Light and Cruiser tanks and about 15 Matildas were rushed up to Tobruk, where they became part of the encircle garrison.

GREECE AND CRETE, 1940. The 1st Armored Brigade which went to Greece had some 60 Cruisers (3d Royal Tanks) and the same number of Lights (4th Hussars). In addition, the Divisional Cavalry regiments of the 2d New Zealand Division and the 6th Australian Division had a number of light tanks. Our Cruisers were mostly A-9 and A-10, which suffered very badly from the track trouble they had experienced in France, but not in the desert. For antitank guns we had 2-pounders, but not in profusion. The Germans produced many Mark IIs and a higher proportion of Mark IIIs, all now with the 50mm gun. They may have produced some Mark IVs: I am not certain. If they did, there were not many. The Mark III with the 50mm was definitely superior to anything we had, and we were hopelessly outnumbered. The few Cruisers we had were kept moving from one threatened place to another, and mechanical breakdowns were responsible for the majority of losses, becoming total losses as the withdrawal began.

To Crete went four Matildas, which were landed at the opposite end of the island to which they were most needed. Before the eastern Mediterranean route was closed, a mixed party of Matildas and Light tanks, amounting to about 30 in all, were sent to Malta. Known as "Malta Tanks," they were chiefly used for clearing wrecked aircraft off the aerodrome runways.

LIBYA: JUNE, 1941. One of the most significant battles of the war, as far as tank and antitank development was concerned, was fought on the Egyptian frontier in June, 1941. It was called "Battleaxe" and was a full-scale attempt to relieve Tobruk. It ended in complete and utter failure. As a result, hardly anyone outside the Middle East was allowed to know about it, which was a pity as there was much to be learned from it. For the first time against the Germans we had a full-scale tank versus tank battle, in which we were superior in numbers. The German tanks were almost all Mark III equipped with 50mms. We had about 100 Matildas and about 150 Cruisers. The 50mm was much superior to our best armament, the 2-pounder. The armor of the Mark III was about equivalent to that of the A-10, but thicker than that of the A-13. The armor of the Matilda was double the thickness of the German.

The main cause of our defeat was the German use of the 88mm antiaircraft gun as an antitank gun. The slow, unreliable Matildas were slaughtered by them. The Cruisers were outgunned by the Mark IIIs and also blown to pieces by the 88s. In addition, the Mark III with its 50mm could knock out our 2-pounder antitank guns, impossible to conceal in the desert, from ranges at which it was itself invulnerable to them. Our only effective antitank weapons were now the 25-pounders of the Royal Horse Artillery diverted from their field rôle.

The lessons to be learned from this battle were:

1. That the only limit to the range at which the 88 could knock out our tanks was visibility—up to 3,000 yards. Therefore only artillery could deal with them. Artillery support of tanks was therefore necessary at all times.

2. Our tanks, with the exception of the Matilda, could not fight a tank versus tank battle on equal terms with the German Mark III.

3. The Matilda was too slow and unreliable to be used as a cruiser tank in the desert.

4. The 25-pounder was the only effective antitank weapon we had.

The result, therefore, was an immediate need for an increase in supporting artillery, partly for the support of tanks, partly for use as antitank weapons. This need was not met.

SYRIA: JULY, 1941. No tanks took part in the Syrian campaign other than Light tanks of the 6th Australian Divisional Cavalry. The French produced some Renault tanks equipped with 37mm, which could be dealt with adequately by 2-pounders. Their presence came as a surprise and they caused considerable casualties when they first appeared, the British troops opposing them having only antitank rifles—those useless weapons, which were for so long an unnecessary burden to the PBI.

LIBYA: WINTER, 1941-1942. At the opening of the "Crusader" operation in November, 1941, we had approximately the following numbers and types of tanks actually in the field:

Matildas, Mark II, 100; Valentines, 50; Cruisers, A-10 and A-13, 150; Crusaders, A-15, 170; General Stuarts (American), 170; total, about 650.

Inside Tobruk we had the 1st Royal Tanks with a mixed collection of 50-odd tanks, varying in type from Matilda to Mark VI Light, and the 4th Royal Tanks with 50 Matildas, brought in by landing craft during the preceding month.

This operation, therefore, saw the arrival of three new types, the Valentine, the Crusader and the Stuart, the Stuart being the first American tank with which we were equipped. Details of these tanks were as follows:

Valentine. Development from the A-10, but with much increased armor. Armament still 2-pounder and two Besa 7.92mm machine guns. Armor 60-65mm, about double the thickness of the A-10. The engine being the same, the Valentine was considerably slower. It was fortunately very reliable. Crew of four.

Crusader. Development from the A-13. Armament still 2-pounder and two Besa 7.92mm machine guns. Armor 40mm. Fast, well-sprung, but hopelessly unreliable, involving constant attention by drivers and fitters. Crew of five.

Stuart. A small light tank, with a badly designed fighting chamber. Armament 37mm, almost exactly equivalent to the 2-pounder, and two .3-in. Browning machine guns. Armor 40-45mm. Its great advantage was its extreme reliablity. Its great disadvantage was its very inadequate petrol tank capacity, giving an endurance of only 40 miles. Crew of four, very cramped. Although its only advantage over the Crusader was reliability, it was much preferred by many.

For antitank guns we had 2-pounders in rather greater numbers than before. The only better antitank gun was in the 1st South African Division. Their antitank batteries each had a troop of 18-pounders, old field guns converted.

Rommel had three armored divisions, two German—the 15th and 21st (the old 5th Light)—and one Italian, the Ariete. Each had about 150 tanks. The majority of the German were Mark III, about equal in armor to the Crusader and Stuart, but better armed with 50mm. A new arrival was the Mark IV. This had slightly thicker armor than the Mark III, but not as thick as the Valentine. It was equipped with a short-barrelled low velocity 75mm, designed as a close support HE weapon, but also very effective as an armor-piercing weapon. These made up less than a quarter of the total. There were also a small number of Mark II light tanks. The Italian were all M-13s, equivalent to the Stuart, but with weaker armor. For antitank guns the Germans were liberally equipped with 50mms and 88mms, the Italians with 37mms and 47mms—neither very effective guns.

We therefore outnumbered the enemy by about three to two in tanks. The Germans had a slight superiority in armor and a definite superiority in tank guns and antitank guns. The proportion of supporting artillery to tanks was still inadequate on our side. Only one armored brigade—the 4th Armored Brigade, equipped with Stuarts—had its own regiment of Royal Horse Artillery.

From the beginning of the series of tank battles which dominated the "Crusader" operation, it was obvious that we were at a great disadvantage, our tanks being vulnerable to the enemy's tank and antitank guns at ranges at which we could not penetrate their tanks. At the end of the first week the three armored brigades of the 7th Armored Division were reduced from a strength of about 450 to a total of 50 tanks. By remarkable efforts of recovery, repair and reorganization, this number was quickly reinforced; but after the relief of Tobruk there were only enough tanks and crews to man one brigade. In spite of our inferiority in the quality of tanks and in quality and proportion of antitank guns to others arms, Tobruk was relieved, and Rommel chased back to Agheila. He was reduced to a strength of 8 tanks at one time before reinforcements reached him at Benghazi. It was a remarkable feat, achieved by courage, determination and skill, helped not a little by Rommel's mad and ineffective dash to the frontier at the crucial period of the battle. The outstanding lessons of the operation were the need for a better gun in our tanks and the need for ample and intimate artillery support for tanks.

LIBYA: SUMMER OF 1942. Our tank strength in the desert in May, 1942, when Rommel attacked, was roughly as follows:

Matilda, Mark II, 150; Valentines, 150; Crusaders, 200; Stuarts, 100; Grants, 150; total, 750.

In addition there was a brigade in GHQ reserve which was brought up in the middle of the battle with a further 50 Grants and 100 Stuarts. The General Grant was an American tank, originally designed as a heavy tank for the close support of infantry. For armor it had 75mm on the turret and 45-50mm on the hull. Its armament consisted of one 37mm in the turret and one 75mm in a sponson in the hull with limited traverse, and two .3-inch Browning machine guns. Its advantages over previous tanks were its slightly thicker armor, its 75mm gun, its reliability and the ample room for the crew. Its disadvantages were the fact that its main armament was low down in the tank, with the result that almost all the tank had to be exposed before the 75mm could be fired, and that it only had limited traverse; in addition it was very bulky, making a big target, and had an endurance of only about 70 miles. Of the three brigades equipped with a proportion of these tanks, two had only received them just before the battle started. Their gunnery mechanism was quite different to any we had had before and entailed considerable training.

For antitank guns a few of the new 6-pounders had arrived just before the battle and had been issued to the armored divisions, but many gunners had not had an opportunity of firing them.

The enemy had about 300 German and 150 Italian tanks. The German were Mark III and Mark IV, with a greater proportion than previously of the latter. Both had reinforced their armor, but the armament remained the same, though in many cases the 50mm of the Mark IIIs was of an improved type with a higher muzzle velocity. The Grant was the equal of the Mark IV, though a more difficult tank to fight, and the superior of the Mark III. The Italian tanks were still M-13s. In antitank guns we now had a few 6-pounders, which were most effective against all enemy tanks in spite of their very bad sights; but the Germans now had 88mms and the improved 50mm on a much more lavish scale. At one period in the battle round Knightsbridge we did use heavy antiaircraft guns as antitank guns with great effect. The advent of the Grant and the 6-pounder was extremely valuable, but the great majority of tank and antitank guns were still 2-pounders and at an even greater disadvantage *vis à vis* the Germans than in the winter. For the first three weeks of the battle the enemy's losses in tanks were generally in the same proportion to his total strength as our own. On June 16, however, we lost almost all our remaining strength of Grants to his antitank guns, while he lost practically no tanks; from then on the balance of superiority in tanks was heavily loaded in his favor.

In the fighting in July, which ended in the stabilization of the line south of El Alamein, we had a definite superiority in numbers of tanks, a complete new brigade of Valentines having arrived, but only a small proportion were Grants. We were still relying mainly on Matildas, Valentines, Crusaders and Stuarts. More 6-pounders were available, in spite of the heavy losses round Tobruk, but the 2-pounder was still predominant.

EL ALAMEIN. In the battle on August 31, 1942, on which Rommel pinned his hopes of reaching Alexandria, we had available approximately 200 Grants, 100 Crusaders, 100 Stuarts and 100 Valentines. A few of the Crusaders were equipped with 6-pounders, otherwise there was no new type of tank on our side. Six-pounder antitank guns were by now fairly plentiful and had almost entirely superseded the 2-pounder. A new high velocity shell had been produced for the 2-pounder, but it was still hopelessly inadequate as an antitank gun. Rommel employed about 300 German tanks, almost all Mark III and Mark IV, mostly the latter. The latest improvement on his side was the Mark IV Special, equipped with the long 75mm (Kwk-40), designed as an antitank gun and superior to the 75mm in the Grant and the 6-pounder. All the Mark IIIs now had the long improved 50mm. Both were carrying extra armor and were considerably heavier than the original design, a fact which caused them increasing mechanical trouble. This time there was no surprise; he had little space to maneuver and we were well ensconced in an excellent battle position. He ran his head right into it and our 75mms and 6-pounders took heavy toll, though we realized that the Mark IV Special was a tank to be reckoned with.

The Battle of Alamein itself was a great milestone in tank development from our point of view, as it saw the advent of the Sherman tank. This was a great improvement on anything that had gone before. Its armor was 65-75mm. Its gun was a 75mm of what was then considered high muzzle velocity, mounted in the turret. Firing armor-piercing shell, it was superior to the Mark IV Special. The guns of each were just about equal in performance, but the Sherman was better armored. Firing HE shell it could compete with the 88mm antitank gun. It was reliable, roomy and excellently designed for fighting.

By now the 6-pounder antitank gun had almost entirely superseded the 2-pounder, and the proportion of antitank guns to other arms was liberal. In addition, a small proportion of Crusaders were equipped with 6-pounders. The Matilda had at last disappeared except for 32 mine-clearing flail tanks, the first ever to be used. Our approximate tank strength at the beginning of the Battle of Alamein was 400 Shermans, 130 Grants, 200 Crusaders, 120 Stuarts and 200 Valentines. Of these 1,050 tanks, 538 carried 75mm guns and 650 were American. The Germans had about 400 tanks and, in addition, a number of self-propelled antitank guns. About half of these carried the long 75mm Kwk-40, the rest 50mm. For antitank guns they had a large number of 88mms and 50mms. The 75mm towed antitank gun had not yet appeared. With the Sherman we had at last not only a vast superiority in numbers, but also a superiority in armor and armament. The 88mm remained the greatest menace; it was defeated by artillery support and by HE fire from Grants and Shermans. There is little doubt that the Sherman was one, probably the main, deciding factor in our victory.

TUNISIA. The British First Army introduced the Churchill to battle for the first time, except for four tanks tried out at Alamein. With armor of 87-100mm and a 6-pounder gun it was a considerable improvement on the Valentine, which it succeeded as the British tank designed primarily for the support of infantry. It was, however, unreliable at that time. Its armor was no real protection against the 88 and it was vulnerable at 500 yards to the new 75mm antitank gun, which the Germans first produced in Africa in January, 1943. Its 6-pounder gun was able to compete with the Mark IV Special, but was useless as an HE weapon.

When it first landed, the British 6th Armored Division was equipped with Crusaders, which it thankfully exchanged for Shermans in February.

At the Battle of the Mareth Line in March, 1943, the Eighth Army had three armored brigades equipped with about two-thirds Grants and Shermans, and one-third Stuarts and Crusaders, an increased proportion of the latter carrying 6-pounders. In addition there was a brigade of Valentines, a small proportion of which were now also equipped with the 6-pounder. For the Battle of Medenine, which preceded it, we had a few of the new 17-pounder antitank guns, but they did not come into action. In his disastrous attack on this occasion Rommel used three Panzer divisions, mostly equipped with Mark IV Specials. By now he also had a number of self-propelled guns, mostly 75mm, on a variety of chassis—Czech, French and German. He was defeated mostly by 6-pounder antitank gun fire and concentrated artillery fire, our own tanks hardly being engaged at all. Where they were engaged, the 75mms of the Shermans and the 6-pounders of the Crusaders did great damage. The Americans with the First Army were equipped with Shermans and Stuarts.

It was not until after crossing the Wadi Akarit in April that the Eighth Army met its first Tiger. This formidable tank had 82-110mm of armor and carried an 88mm gun. It was, therefore, more heavily armored than the Churchill, which appeared in the field about the same time, and very much better armed. The only antitank gun we had which could deal with it was the 17-pounder, of which there were very few at that time. Luckily there were also few Tigers. They were not, we believed, reliable. By the time we in the Eighth Army met them, the Germans had already lost the campaign except for the final stand round Tunis, and they were chary of risking the loss of precious Tigers. They therefore inclined to withdraw when heavily shelled and did not prove the nuisance they might and could have been. At the end of the campaign in Tunisia we had an overwhelming superiority in numbers of tanks, an increasing number of which were Shermans, which had proved the superiors of all German tanks we had met except the Tiger. We had evolved tactics, employing the intimate coöperation of HE fire from artillery and tanks, directly or indirectly fired, which defeated the normal ground antitank gun, 50, 75 or 88mm, in open country. The PIAT in the British Army and the Bazooka with the Americans had begun to replace the obsolete antitank rifle as the light short-range personal antitank weapon of the infantry, both firing hollow-charge HE projectiles. The 17-pounder had just begun to appear and was for a short time the best antitank gun on either side in the field. At any rate it had proved capable of dealing with the Tiger at over 1,000 yards.

SICILY AND ITALY, 1943. The end of the North African campaign saw the end of the Grant, the Crusader and the Valentine. The Stuart remained on the scene, in small numbers in the British Army, in greater quantity in the American, purely as a reconnaissance vehicle. It was definitely now a light tank. All the British, Canadian and American tank units which took part in the campaign in Sicily and in Italy up to the end of 1943 were equipped with Shermans throughout. The Churchills remained in North Africa and did not come over to Italy until 1944. The Germans produced few tanks in Sicily and not many were seen in 1943 in Italy, except in the counterattacks at Salerno and on the River Sangro. The country and the fact that the Germans were permanently on the defensive gave an added importance to their antitank guns. The most notable changes were the great increase in self-propelled antitank guns of all calibers up to 105mm. Inconspicuous, mobile and armored all-round and overhead against shell fragments, they could not be defeated by the tactics of HE fire used in North Africa. In addition, the thick country and the introduction of flashless powder made it very difficult to locate guns when they fired. The ranges at which most tanks were knocked out were now about 100 yards instead of 1,500, which had been the average in Africa.

The other main advance in German antitank weapons was the first appearance of the 88mm designed purely as an antitank gun, no longer dual purpose antiaircraft and antitank. It was lower, more mobile, had an armored shield, improved sights and a considerably improved performance. The Germans also produced in larger numbers different types of light taper-bore antitank guns. These fired a small projectile which had a considerable power of penetration. On our side more 17-pounders were available and we had also a number of American self-propelled 76mm antitank guns, called by the Americans "Tank destroyers" or M-10s. These had a better armor-piercing performance than the 75mm in the Sherman, but not as good as the 17-pounder, and were not really effective against the Tiger except at very short ranges. The Germans did not produce their version of the Bazooka in Italy until 1944, although they had long used hollow-charge shells fired from field guns.

NORTHWEST EUROPE, 1944-1945. The main features in the development of tanks and antitank guns by the time that the invasion of Normandy took place were the following:

British

1. Introduction of 17-pounder in Sherman. (Ratio of one 17-pounder to three 75mm in fighting troops.)
2. Appearance of Cromwell, armed with 75mm.
3. Introduction of 75mm in Churchill (ratio initially one 75mm to two 6-pounders in fighting troops and subsequently two 75mm to one 6-pounder).
4. Introduction of flame-throwing Churchill (Crocodile).
5. Use of amphibious tanks (Shermans).
6. Increase of armor on Churchill.
7. Improvement of mine-clearing tanks and increase in numbers. Sherman Crab.
8. Disappearance of 2-pounder antitank gun. The 17-pounder now standard, with the 6-pounder replacing the 2-pounder in infantry battalions.
9. Increased number of self-propelled antitank guns. Conversion of proportion of M-10s from 76mm to 17-pounder.
10. Introduction of rocket-firing aircraft.

American

Nil, except that some Shermans were equipped with

76mm in place of 75mm and that the Stuart was relegated to reconnaissance only, though still used in larger numbers than in the British Army.

German

1. Appearance of Panther.

2. Increased proportion of Tigers and Panthers.

3. Vast increase in numbers of Bazooka-type weapons.

4. Increase in number, type and effectiveness of self-propelled antitank guns.

When the 21st Army Group was completely ashore at full strength its British, Canadian and Polish forces had approximately the following numbers of tanks in the field, excluding reserves outside units:

Sherman 17-pounders, 320; Sherman 75mm, 1,400; Cromwell, 390; Churchill 75mm, 50; Churchill 6-pounder, 400; Churchill Crocodile, 60; Sherman Crab, 120.

Of this total of about 2,740 tanks, two-thirds were American. All the self-propelled antitank guns were American, although about a third had British 17-pounder guns in them. Not counted in this total were about 150 AVREs (Armored Vehicles Royal Engineers), all Churchills. Equipping Shermans with 17-pounder guns was a British idea, the conversion being carried out in England. Only British, Canadian and Polish tank units were equipped with them—no American.

As the campaign proceeded, the total number of tanks in the field declined, as the size of the British armies dwindled also. The main changes were an increase in the proportion of 17-pounder to 75mm Shermans, the proportion doubling by the end of 1944; the conversion of all Churchills to 75mm and an increase in the number with thicker armor; an increase in the number of Crocodiles and the conversion of all self-propelled antitank guns to 17-pounder, including the appearance late in the year of a British self-propelled 17-pounder antitank gun on a Valentine chassis, replacing a proportion of towed 17-pounders. Later still, in the spring of 1944, one armored division, which had been equipped with Shermans, was re-equipped with British Comets. There were also important developments in armor-piercing ammunition. These, however, did not become effective until after the end of fighting in Normandy. The Cromwell had the same armament and approximately the same armor as the Sherman. It was smaller, faster and, unlike its prototype the Crusader, reliable. An attempt to produce a modified Cromwell, called a Challenger, with a 17-pounder in it, was initially not a success because the tank was mechanically unreliable. The unreliability was eventually overcome. The Comet, developed from the Cromwell, appeared first in the field after we had crossed the Rhine: it had improved armor and armament, as well as better cross-country capacity.

On the German side the outstanding success was the Panther. Its main armament was a long 75mm (Kwk-43) of performance equivalent to our 17-pounder. Although the sides of both turret and hull were considerably thinner than those of the Tiger, the front of the turret was 110mm and the front of the hull formed by two plates, the main glacis plate being of 80mm sloped at an angle of 55° from the vertical. This combination of thickness and angle made it immune from 17-pounder fire at over 800 yards. The Panther was lighter, more maneuverable and apparently more reliable than the Tiger. The final development in German tanks was the Royal Tiger. Very few of these were ever met, only one or two before Falaise. It carried the latest type of 88mm, with a performance considerably superior to the 17-pounder. The armor was a considerable improvement on the original Tiger, thicker and with sloping instead of vertical plates. Thicknesses and angle from vertical were: Turret front 180mm at 10°, turret sides 80mm at 20° Hull front: top plate 150mm at 50°, bottom plate 100mm at 50°. Hull sides and rear 80mm at 25°. It was a very formidable tank, but one which in view of its weight, petrol consumption and size must have presented to the German staff many problems in its movement.

In addition to Panthers and Tigers, the Germans had a large number and variety of self-propelled antitank guns, chief of which were the Jagdpanther and Jagdtiger. These carried the latest types of 75mm and 88mm guns, had very thick front plates and were armored overhead against shell splinters. They were less conspicuous than tanks, but had only a very limited traverse. For towed antitank guns, 88mms were plentiful, but the 75mm Kwk-40 provided the great majority. In the later stages of the campaign, particularly beyond the Rhine, the 50mm and even the 37mm reappeared in greater quantities, but in Normandy the 75mm and 88mm were the standard antitank guns.

The development which caused us greatest trouble and which forced a revolution in tank tactics was the introduction on a lavish scale of the Bazooka and its smaller equivalents, the Panzerfaust and Eaustpatrone. These were all different forms of hollow-charge projectiles varying in range from 50 to 200 yards, cheaply and easily produced. Right up to the very end every detachment of German Infantry was liberally supplied with them; they were capable of knocking out all our tanks, even the heavier Churchills. They were especially effective in the thick *bocage* country of Normandy and in villages and woods.

On our side probably the most significant development as far as this campaign was concerned was the Crocodile flame-thrower, though without the 17-pounder Sherman we should not have got far. On the German side the Bazooka and its lesser brethren, and the Panther and its self-propelled antitank gun equivalents were the most notable. In addition we had the added advantage of the rocket-firing fighter, which was particularly effective against armored fighting vehicles on the move on approach marches or in withdrawal.

THE RUSSO-GERMA

by Captain Ferg

PART

(Although the battles outlined in this story have been covered in thorough detail in previous issues of the JOURNAL, *we feel that this report gives such an over-all and comprehensive view of the Russo-German campaign that it warrants publication. The second installment will be carried in the next issue of the* JOURNAL.—EDITOR'S NOTE.)

DURING the six years of war in Europe the needs of security prevented the publication of many facts concerning the campaigns, but now that hostilities have ceased the true story of the major operations is rapidly being made known. In Britain and America, in addition to the official documents that are being placed before the public, commanders who held important positions are putting into print the details of the great actions which occurred under their control, and the errors as well as the successes are being disclosed. But from Russia comes little information. The Soviet government evidently intends to keep for its own use the war lessons learned by the Red Army.

Bearing this in mind—and bearing in mind also that Russia is the newest and now one of the two greatest military or land powers in the world and therefore a subject of great military interest, anyone wishing to study the late war in Russia, either for its general lessons or for their possible application to the future, must look far and wide and learn to apply the smallest details of scrappy information to the general principles which govern them.

Since the middle of the nineteenth century the Russian Army (Tzarist and Red) had few successes to weld into a tradition. In the 1914-17 war the "Russian hordes" found that strategy was of greater value than numbers, but the lesson was learned too late to be applied. The operations of the new Red Army (1918-21) against the White Russians and later against the Poles showed the same weaknesses as under the Tzar. In 1939-40, the war with Finland appeared to be equally badly conducted. Here, however, the would-be omniscient observers "missed the bus," for it was not through Soviet mismanagement that the Finns remained so long undefeated. Nor was the Finnish war (as some said later) "a great bluff." The Russians fought well, but the terrain and the Mannerheim defenses, the short front and the hard winter, made greater speed of advance impossible.

The Russian soldier is as good as any other, obedient if rather undisciplined, earnest if often illiterate.[1] His commanders are good, the staffs generally competent. Russian generals are inclined to independence of action and occasional unorthodoxy in method, but in so large a country every army commander must, after all, be his own commander in chief. In the field of tactics and strategy a certain weakness is, however, very noticeable.

The greatest Russian want, not alone in 1941, but all through the hardest war years, was good up-to-date equipment. Lack of equipment, especially of transport and signal equipment, made strategic operations slow and cumbersome, and the Russians had to make up for surprise by an overwhelming superiority in man power. In *"Our Armored Forces,"*[2] Lieut.-General Martel points out how the Russians never attempted an offensive unless they had a three- or four-to-one superiority. They were amazed at the intrepidity of the British in Libya, who dared to attack when they were actually weaker than the Germans and Italians opposing them.

The organization of the Red forces was, in the main, similar to that of other nations. But a rigid "war establishment" was something unknown to the Soviet commanders, and they were willing to fight with any combination of units. Each army commander developed his own organizational system within his own command.

The air forces were mainly divided into three types. The most important was Army Coöperation Command, whose units acted directly under army control. Next came Long-Range Bomber Command, and finally Defense Command. An Air Army was normally attached to each Army Group or Front. A Front comprised two to five armies. The air army was made up of air divisions, each of three or four air regiments. The air regiment contained two to four squadrons of 15 aircraft per squadron.

In addition to their bombers, fighters and reconnaissance aircraft, the Russians employed *Stormoviks*—heavily armored planes used for strafing ground troops from a low level. Many of these aircraft carried cannon

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★*An Cosantoir,* The Irish Defense Journal.

[1] Despite Soviet statements to the contrary, the standard of illiteracy in the U.S.S.R. is still extremely high.

[2] Reviewed in the April issue of *An Cosantoir* by the author of this article.

N BATTLES–1941-45★

s. N. Fitzgerald

ONE

for attacking hostile tanks.

The armored unit was the Corps. An Armored Corps contained a tank brigade (about 180 tanks), three lorry-borne brigades, and the usual complement of auxiliary arms. It was therefore, the approximate equivalent of a German, U. S. or British Armored Division.

The tanks used were the T.34 cruiser tank for exploitation rôles, and the K.V.[3] tank (and in 1944 the Stalin tank) for infantry-supporting action. Captured German tanks, and vehicles supplied by the Allies (especially the British Churchills), made up a very great part of Russian armor.

If one disregards the initial gains made by the Germans in the Summer and Autumn of 1941, when the Red Army was still raw and inexperienced, one must recognize that the chief feature of the Russian forces was an ability for dogged defense in the face of overwhelming odds. The loss of Kiev was not to be repeated, and in 1942 Voronezh and Stalingrad held out heroically until the Soviet reserves were ready to launch their counteroffensive. In this way the German principle of victory through strategic break-through failed to be realized.

On their part, the Russians concentrated on the tactical employment of armored formations. Local break-throughs were exploited to turn German strongpoints. At Stalingrad, Orsha and Bobruisk, Russian tank columns (with accompanying mechanized infantry and artillery) forced their way through the defenses and then pushed the assault from the rear, while the less mobile elements exerted pressure on the front and contained the German troops. Tactical envelopment by mechanized forces became the main use of Russian armored units in attack.

In defense both sides employed tanks as improvised pillboxes and to augment the artillery. Tank formations were also widely used as operational reserves, to counterattack wherever a hostile break-through appeared likely. According to Soviet sources, the German High Command issued several instructions dealing with the use of operational reserves. In particular, the High Command insisted that such reserves should not be split, but should be used together in the main counter-effort. This doctrine is self-evident, but it is not an easy one to put into practice. The enemy does not disclose his plan in the initial stages, and a number of factors may cause the commission of parts of the operational reserve on minor tasks. In January, 1944, General Tolbukhin was exerting strong pressure on Kirovograd and Krivoi Rog. The operational reserves of the Sixth German Army which held this area comprised two panzer divisions. Since a break-through at either of these points would threaten the entire German salient, a panzer division was dispatched to each of the locations menaced. When the attack on Nikopol, at the apex of the salient, took place in February, there were no general reserves available to meet it. With difficulty the panzer formation at Krivoi Rog was disengaged and sent toward Nikopol, but Tolbukhin's army had already defeated the German infantry and the reserve division was unable to stem the hostile advance.

In their counteroffensives, the Germans generally employed panzer units against the flanks of the enemy salients. The panzers were supported by infantry whose task it was to consolidate the gains won by the armor.

One of the major difficulties in the employment of large tank formations, particularly over long distances, is the control of sub-units. In the open steppes of southern Russia geometric formations were adopted by the Red Army and maneuvers were carried out with precision, even on the battlefield. This greatly simplified the commander's task, as he could observe progress and maintain direction without continually resorting to the radio—an instrument exceedingly scarce in the Soviet armies. Most frequently employed formations were the arrowhead, inverted arrowhead and echelon. Their use was similar to that of the equivalent infantry formations; arrowhead gave ample protection to the flanks, inverted arrowhead was used in enveloping maneuvers, and the echelon was employed when one flank only had to be covered.

It was learned that a single line of tanks, although it had great striking power and was often able to secure an initial penetration, lacked drive and was easily held. Tank attacks were therefore made in waves, the leading wave halting on the first objective and permitting the supporting waves to pass through under its covering fire.

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[3] The T.34 cruiser tank weighed 27 tons and carried a 76mm gun and three M.G.s. The K.V. was 47 tons, with a 76mm gun and three M.G.s. The Stalin tank, used in the later battles, was an improved version of the K.V. type. Compares with German Tiger, 54 to 60 tons; U.S. General Sherman, 30 tons; British Churchill, 37 tons. Russian light tanks were the B.T. (13 tons) and the T.26 (9 tons); both were armed with a 45mm gun and two M.G.s.

If tank units led the attack, the infantry followed under the shelter of the vehicles, each wave being supported by a separate infantry force. An essential in all advances was a tank reserve, held in rear and ready to deploy as required.

The German units employed in Russia after 1941 were organized altogether differently from those used in the western and desert campaigns. In general, the divisional formation was only 60 per cent of what it was at home or in Libya. As far as possible the number of automatic weapons was kept at a high level, but the man power and the tanks were reduced considerably. The panzer divisions in the Soviet war contained only 250 to 300 tanks, instead of the normal complement of 350 to 400. In panzer corps and armies, the proportion of infantry was in an exceeding high ratio to the number of tanks.

KIEV OPERATION—SEPTEMBER, 1941

The German invasion of Russia opened on June 22, 1941. By the beginning of August two German army groups stood northwest and southwest of Kiev. Von Bock's northern Group had taken Smolensk on August 7 and was now halting a moment in its "march on Moscow." This group contained Von Weich's Second Army and Guderian's Second Panzer Army. To the south Von Rundstedt's Group (Von Reichenau's Sixth Army and Von Kleist's Panzer Army) was near Katazin. Between Von Bock and Von Rundstedt lay the Pripet Marshes.

Early in August Von Rundstedt's armies converged on Uman where a strong Russian force was concentrating. The battle lasted until August 12, when Von Kleist's divisions broke through towards the Black Sea, and then swung northwards again towards Kirovograd on the Dnieper. Von Reichenau similarly advanced to the Dnieper near Belaya Tserkov and Cherkassy. Here both armies halted, for the advance to Kharkov—the next objective—could not be undertaken while the Kiev salient remained, and Von Rundstedt was unable to reduce it unaided.

The German plan was to execute a "double-double-envelopment" about Kiev in the manner of the Warsaw campaign of 1939. There was, however, this difference: in Poland the inner arms of the pincers had been by far the stronger, but in the Kiev operation it was the outer arms that would be the more powerful.

Von Rundstedt concentrated his two armies on the Dnieper, while Von Bock diverted Von Weich's force to the Mogilev area and Guderian's Panzer Army to Roslavl. Almost 300 miles separated the two army groups.

On September 1 the outer arms of the two army groups commenced their drives north and south. Von Kleist gained a bridgehead over the Dnieper at Kremenchug and moved towards Lochvitza. At the same time Von Reichenau's units crossed at Cherkassy and Kanev and marched westward toward Kiev.

But the decisive blow was to be struck by Von Bock from the north. When the decision was taken to encircle Kiev from both flanks, his army group had moved southward and by August 20 had taken Gomel, Guderian's tanks attacking the town from the rear while Von Weich assaulted frontally. By the end of August Guderian had forced the Desna at Novgorod Seversk and Von Weich had crossed at Chernigov. The bank of the Desna was Von Bock's line of departure, as the Dnieper Von Rundstedt's.

While Von Rundstedt drove northward across the Dnieper, Von Bock launched his offensive toward the south. By September 10 the break-through had been made in both sections and the panzers of Guderian and Von Kleist raced toward each other almost unopposed. Four days later the leading columns met at Lochvitza and Priluki. With the severing of Marshal Budenny's communications the main task of the panzers was completed. They now endeavored to prevent the escape of the Russian forces trapped in the Kiev region, while Von Weich and Von Reichenau closed in on the city with their infantry armies.

On September 10 Marshal Budenny started to evacuate the salient, but the movement came too late. On September 20 Kiev fell to the Germans. It is probable that 600,000 Russian troops were taken at Kiev, apart from the casualties in the fighting on the flanks of the salient. Only one of Budenny's five armies escaped the German encirclement.

Budenny can hardly have been surprised by the operation. The German preparations were carried out quite openly. But the speed of the panzer attack in the later stages of the battle undoubtedly achieved local surprise in many places. The Soviet Command showed a lack of decision in this operation, neither defending Kiev to the last nor yet ordering its evacuation while there was still time. The conquest of 25,000 square miles of territory in any Western European state would have spelt disaster; in the U.S.S.R. the loss was severe, but not final.

GERMAN OFFENSIVE AT STALINGRAD—1942

The most famous defense of World War II is that of Stalingrad. The Volga city itself was not the objective of the German offensive; it was by accident rather than by design that the Wehrmacht's forces were concentrated against it.

In 1942 the German General Staff abandoned the attempt to take Moscow by frontal assault. Instead they planned to seize the Caucasus with the threefold objective of cutting the Allied southern supply route to Russia, capturing the oil wells of Maikop and Baku, and turning the strategic flank of the defenses before Moscow and the west-Russian industrial centers. Had this plan been applied in 1941, instead of the dual offensives on Moscow and South Russia, the Soviet Union might have been defeated. As it was, by 1942 the Russian positions had been stabilized and the Russian armies tried in battle. During the winter of 1941-42 they had even taken the offensive and had proved that under favorable circumstances they could drive back the Germans.

The German units in 1942 were greatly reduced in strength from the 1941 models. Furthermore, the High Command was obliged to depend to a considerable extent on auxiliary forces from Rumania, Hungary, Italy and Finland. There were 65 auxiliary divisions in Russia at this time, and it is a universal military truth that auxiliaries are of little value. The Russians soon learned to appreciate this fact when Marshal Zhukov's counteroffensive began.

By May 1942 the Germans had three army groups ready to open the attack in southern Russia. About Kursk stood Von Weich's Group—the Second Army and the Second Panzer Army, which had played so vital a part in the Kiev campaign during the previous year. Von Hoth commanded the Fourth Panzer Army and Sixth Army north of Kharkov. The First Panzer Army and Seventeenth Army, under Von Kleist, were between Kharkov and Stalino. Farther to the south, Manstein's forces were operating in the Crimea.

It will be observed that each army group comprised an infantry and a panzer army. The three groups, under the command of Von Bock, amounted to some 16 panzer divisions, six motorized divisions, 40 infantry divisions and between 15 and 20 Italian, Hungarian and Rumanian divisions.

On June 22 the initial "mopping up" of Russian forces along the proposed line of departure had been completed and the great offensive opened with the advance of the southern army group from its bridgehead over the Donetz at Kupiansk. On June 28 the second offensive blow was struck by Von Weich in the north; by July 1 the Second Panzer Army had broken through toward Voronezh. The next day Von Hoth's central group advanced eastward.

The front upon which Von Bock's offensive opened was little more than 250 miles long. It was not surprising, therefore, that the Russian defenses were rapidly pierced. On July 6 elements of the Second Panzer Army crossed the Don and entered Voronezh. This exploit savored strongly of a similar dash to Warsaw, three years earlier. As on the previous occasion, the tanks were insufficient to take the city, and when the Second (Infantry) Army arrived before Voronezh on July 10 the Russians had concentrated large forces—including armor—and a furious 10-day tank battle ensued.

The River Don forms a salient, pointing eastward, with one of its cornerstones at Voronezh, the other at the Black Sea, and its apex at Kalach, some 50 miles short of Stalingrad. The Germans intended to occupy this salient with two army groups while the third took the cornerstone, or haunch, Voronezh. The River Volga forms a second salient pointing eastward, this time with Stalingrad as the cornerstone on the north, the Black Sea again on the South, and Grozny the apex. One of the two remaining army groups would enter this salient and drive toward the apex, while the other took the cornerstone, Stalingrad. It was a simple geometric advance in echelon-from-the-right. It was, however, essential that the cornerstones, Voronezh and Stalingrad, should be captured, for if they were not, then the Russians would be left with pivots from which to launch a counteroffensive against the long German lines of communication. When, therefore, it became clear that Voronezh was not to be taken easily, Von Bock determined that the second cornerstone—Stalingrad—should not remain to menace the drive into the Caucasus.

On the southern wing of the attacking armies Von Kleist's tanks reached Millerovo on July 13. Manstein had now cleared the Crimean Peninsula and was free to join in the assault eastward. The Germans turned toward Rostov. But on July 27 the Russians abandoned the famous Don city, falling back before the converging attacks of Von Kleist and Manstein. By August 1 the First Panzer and Seventeenth Armies were south of the Don, heading for Elista and Maikop in the Caucasus region. Von Hoth's two armies were making for Stalingrad, via Kalach.

The Russian Supreme Command also appreciated the importance of Stalingrad (as they had the importance of Voronezh) and determined to hold it, even at the temporary sacrifice of the Caucasus. The proximity of the Don and Volga bends made strategic defense impossible, and the Soviet Command was forced to rely, therefore, on tactical defense near the city and even within the built-up area itself.

By August 15 the Germans had forced the Don at Kalach and 10 days later made another crossing at Kletskaya. To the southwest Manstein's troops from Rostov, reinforced with panzers from the now stabilized Voronezh front, neared Kotelnikovo. The Red Army threw in tank formations to oppose the Germans on the Askai River and large-scale tank battles resulted. By September 3 the Germans had the upper hand, although their tank losses reached a new height in this struggle. There were now some 750,000 men and 2,500 tanks closing in on Stalingrad.

At this stage the maneuver period was over. Sheer weight of numbers could alone bring the campaign to a close, for the strongly defended Volga line rendered an outflanking maneuver impossible.

To hold Stalingrad until a counteroffensive could be prepared, the Russians had left the northern Caucasus weakly held. Von Kleist's panzer and motorized units took Voroshilovsk on August 4 and on the next day reached the Kuban. On August 8 the Russians evacuated Maikop and by the 25th Von Kleist had reached Mozhdok on the Terek River. Here at last the Russians made a stand. A huge area had been conquered by the Germans—in the manner of Poland, France and Yugoslavia—with a comparatively small army composed mainly of panzer and motorized units. But unlike those earlier campaigns, a final defense was put up, strong enough to delay if not to hold Von Kleist's forces.

In the mountain areas the German panzers found rapid advance and exploitation more difficult, and during September and October the struggle was slow and costly. Novorossisk was captured on September 10, but before Tuapse, as well as at Mozhdok, the offensive was held. On November 2 the Germans turned the Terek line, but on the 15th their tanks were routed near Ordzhonikidze.

Back on the Volga the close fighting continued. From September 15 to October 15 the German assaults were at their heaviest. Tanks, infantry and artillery were flung into the streets of the city, and at many points the attacking troops reached the Volga—only to be driven off again in fierce counter-charges. One surprising feature of the Stalingrad battle—which continued with less intensity on the part of the Germans until November 18—was the fact that no sizable reinforcements were ever sent to the commander of the Soviet garrison, General Chuykov. The Russian High Command was holding all its reserves for the great counteroffensive. Three armies were in the process of creation; two on the northern bank of the Don, northwest of Stalingrad, under Generals Vatutin and Rokossovsky, and the third, led by General Yeremenko, in the Ergeni Hills south of the besieged city.

Russian Offensive at Stalingrad—1942-43

By the middle of November the Fourth Panzer and Sixth Armies, now commanded by General Von Paulus, consisted of four panzer, three motorized and 15 infantry divisions. The bulk of this force was committed on the Krasnormeisk-Orlovka line, running through the factory districts of Stalingrad. Back across the 50-mile wide plain to the Don were German defenses, covering the supply bases and airfield that Von Paulus had constructed in order to relieve the long lines of communication and make him partially independent of the strategic depots west of the Donetz.

On Von Paulus' northern flank, reaching back along the River Don, were Rumanian and Italian formations. South of the Sixth Army, 13 Rumanian divisions, with some tanks and cavalry, held the railway line. The right flank of these Rumanian units was "in the air," only cavalry patrols maintaining contact with Von Kleist's armies in the Elista area. While the Stalingrad front was extremely strongly held, therefore, the northwestern sector was weak and the southern sector open. Farther back still, only minor forces of Von Weich's reduced army group opposed the Russian General Golikov at Voronezh. No sizable strategic reserve had been held out by the Germans.

It is hard to understand how the German High Command could have so blindly concentrated almost their entire striking force in the Stalingrad region or how the Wehrmacht commanders failed to observe the Russian preparations for a counteroffensive along the Don front. Von Paulus must have known that the Red Army defenders of Stalingrad did not represent the major portion of the enemy reserves. Yet when the Soviet counteroffensive opened on November 19, 1942 the Germans had made no preparations to meet it.

On November 19 Rokossovsky struck out across the Don at Serafimovich. By the next day a 20-mile gap had been made in the Rumanian defenses and Russian armor poured through. While one column made for Chernyshev another turned westward on Kletskaya and Kalach. The break-through was totally unexpected and the armored troops recrossed the Don at Kalach on November 21, taking Von Paulus' Sixth Army in the rear. The counteroffensive was only two days old.

On Rokossovsky's right General Vatutin also broke through the Don defenses. Together with part of Rokossovsky's armor, Vatutin defeated a Rumanian force north of Chernyshev and by the 21st he had crossed the Chir River and his armor was deploying over the steppes toward Millerovo and Likhaya. On the 22d three panzer divisions were met and defeated south of Chernyshev. A strategic break-through had been accomplished.

South of Stalingrad the Rumanian line lay along the railway. The troops were not, therefore, in a position to overlook General Yeremenko's approach from the Volga to the Ergeni Hills. On November 19, while Rokossovsky and Vatutin crossed the Don, Yeremenko descended the slopes to fall on the Rumanians. On the 20th he pierced their line at Abganerovo, near the junction of the Rumanian and German forces. By the 25th Yeremenko was approaching the Don, his right wing only 20 miles from Rokossovsky at Kalach. Von Paulus was almost surrounded.

Marshal Zhukov, the commander of the counteroffensive operations, did not make the error of exploiting too rapidly. The temptation to do so must have been great, for the undefended steppes presented an invitingly open region to the Russian tankmen. But the Russians had begun the attack with barely half the transport required for such a move, and rashness at this stage might have been disastrous. During the last days of November Zhukov consolidated what he had won.

It was obvious that to escape the ring which was closing about him, Von Paulus must fall back at once, preferably along the Stalingrad-Rostov railway line. His depots and airfields in the Don-Volga area must be abandoned, together with most of his heavy equipment. There was still some hope, if he could hold the Chir and the Askai river lines, of covering Von Kleist's withdrawal from the Caucasus.

A relief force was being assembled under Manstein about Kotelnikovo, but there were no reserves of sufficient strength to throw back the Russian attack. Russian moves on the central front about Orel and Bryansk were holding down the German units in those areas. Von Paulus could expect little assistance from outside his command. Yet he was forbidden to attempt withdrawal. The reason for this may, indeed, have been partly a fear for Von Kleist, still many miles to the east of the Sixth Army. But Von Kleist's forces were neither as strong nor as well-equipped as those before Stalingrad, and their loss could not therefore be as serious. A second reason existed for holding the Sixth German Army within the grip of the closing Russian pincers. Hitler feared the result to German prestige of abandoning the city which had been so greatly publicized in the world's press.

On December 10 Manstein's relief force—some 150,000 men, and four divisions of panzers—set out northeastward from Kotelnikovo. On both sides of the Don, at Gremyachev and Nizhnechirsk, violent tank battles took place with Yeremenko's armored flank-guards on December 16. Had Von Paulus made a coördinated attack at the same time from the north of Yeremenko's corridor instead of an abortive effort to retake Kalach a week earlier, something might have been achieved. But by December 18th Manstein's assaults petered out and he was compelled to withdraw toward Rostov.

In the meantime on the Voronezh front, Golikov, supported by Vatutin's right wing, launched an offensive across the Don at Boguchar, cutting General Gariboldi's Eighth Italian Army in two. By December 24 this new advance, combined with the other blows they were receiving, obliged the Axis troops in this region to fall back towards Millerovo. General Malinovsky's Armored Corps were in action against Manstein in the Kotelnikovo area and on December 27 this German strongpoint fell to the Russian Commander.

By December 31 Von Paulus was surrounded, Manstein was in retreat, the whole Don salient was collapsing, and Von Kleist's Caucasian front was in imminent danger of being cut off from Rostov. Von Kleist had already been weakened by the transfer of some of his panzers to Manstein early in December. Now it was clear that he must fall back on Rostov. To do this his rearguards would have to be sacrificed.

By the end of December the Seventeenth and First Panzer Armies had abandoned the Terek line and General Maslennikov was in pursuit. After a sharp fight the right wing of the Russian Trans-Caucasian Army entered Elista on January 1, 1943. The Russian general had hoped to cut off Von Kleist by turning southward from Elista, but the German main body was already far to the west. On January 23 the Soviet troops re-entered Armavir, but Von Kleist had passed through the gap between Malinovsky's forces at Konstantinovsk and the Sea of Azov. Another large group withdrew to Novorossisk, where they held a considerable beachhead against repeated Russian attacks until the Summer of 1943.

At Stalingrad the New Year saw the liquidation of Von Paulus' Armies by Rokossovsky and Chuykov. After an ultimatum sent to the German commander on January 7, which the newly promoted Field Marshal rejected, the Russian attack commenced on the 10th. Some 80,000 men remained inside the Russian "steel-ring"—the rest (once 250,000) had been killed or captured. A fortnight later only one quarter of these were still fighting. On February 2 Field Marshal Von Paulus surrendered and the Sixth Army was finally eliminated.

Thus ended one of the most dramatic episodes of the entire war. It occurred shortly after the British victory at El Alamein and formed the second decisive battle of World War II. The campaign had peculiar features which are not easy to explain. The Germans, who started out so successfully, made glaring blunders of the most elementary kind. Did they really believe that the Red Army had no reserves, or that the reserves would not be in a position to counterattack as soon as they did?

In his article, *Strategic Objective*, which appeared in the Moscow bulletin *Voks* in 1945, Major-General Galaktionov quoted Marshal Stalin's speech of November 6, 1942: "What then, was the main objective of the German offensive? It was to outflank Moscow from the east; to cut it off from its Volga and Urals rear and then to strike at the city. The German advance southward, toward the oil districts, had an auxiliary purpose; not only, and not so much, to capture the oil districts as to divert our main reserves to the south and to weaken the Moscow front, and thereby facilitate the success of the blow at Moscow. . . . In short, the main objective of the German summer offensive was to surround Moscow and end the war this year."

The Russian leader—and with him Major-General Galaktionov—wishes to show that the Caucasian drive was merely a subsidiary effort on the part of the Germans. This is not unlikely, but the fact remains that to outflank Moscow by pushing east of Stalingrad necessitated the capture at the same time of the entire oil region up to the Caspian Sea. It is noteworthy also that neither the Marshal nor Galaktionov mentioned another German objective—the severing of the Allied supply route through Iran.

The Russian handling of the counteroffensive was far from perfect. After the first assault the energy of the Red forces appears to have died down. Not all the reserves were engaged in mopping up Von Paulus' Sixth Army, and ample time was given to seal the Rostov gap and prevent the extrication of Von Kleist's armies in the Caucasus, yet this was not done. However, the German losses were so great, and the blow to their prestige so powerful, that they never fully recovered in Russia.

(To be continued)

In the next issue of the JOURNAL *Captain Fitzgerald continues his examination of the major battles of the Russian war. He deals with the German offensive against Kursk in 1943, Tolbukhin's conquest of the southern steppes, the Russian assaults on Orsha and Bobruisk in 1944 (where they broke through the defenses of the "Panther Line"), Malinovsky's advance across the plains of Hungarian Transylvania, and finally the battle of Berlin.*

Japanese Preparations for Philippine Conquest[*]

by Captain T. W. Davison, U. S. Navy

THE following remarks reflect my personal observations of Japanese activities in the Philippine Islands during my tour of duty there from December, 1939, to May, 1942, two days before Corregidor fell. They in no way reflect any official opinion of any department of the United States Government.

For convenience, I shall group these Japanese preparations for conquest under two headings—Strategic Preparations, and Tactical Preparations. The former can be dismissed briefly, as they follow the German and Japanese pattern so common the world over.

Long-term, or strategic, preparation for conquest consisted in establishing a "Little Japan" colony in many key localities. One of the most publicized of these before the war was at Davao on the Island of Mindanao in the Southern Philippines. The inhabitants enjoyed local government to a large degree, wore native Japanese dress a considerable part of the time, had their man power mobilized into a closely organized, well-disciplined corps of "athletes," and conducted schools of their own where Japanese language was used and the Samurai code extolled.

Manila and other cities in the Philippines had similar Japanese colonies, the only outward difference being that the inmates followed city customs and were therefore less noticeable than their country cousins because of wider use of the conventional business suit, higher attendance at American-Philippine public schools, and greater use of English as the commercial language of the Far East.

There were two bluejackets in my crew who spoke Japanese, presumably having learned it from association with Japanese during some years of duty with the Yangtze River Patrol. One lived with a Japanese woman in Manila in the Japanese section of the city. The other had been married for some years to a Japanese. These men used to tell me "off the record" of some of the parties they attended in Nipponville. At suki-yaki dinners served over cozy little charcoal fires, their hosts would grow mellow and boastful, and drink toasts in warm saki to the Japanese equivalent of the old Prussian "Der Tag." There seemed little doubt in anyone's mind that "the Day" meant Japanese conquest of the Philippines—and, of course, much more.

These bluejackets showed every outward indication of being entirely loyal to the United States. As I look back now I wonder if they did not have a very good hunch as to when war was coming, for each managed to wangle a swap with a man on another ship. Their new ships departed on the outbreak of war; ours remained for the hopeless task of defending Manila Bay.

The strategic preparation for conquest was nothing more than having a part of Japan functioning in many localities of the Philippines before war in a social, economic, political, and secretly military sense. On the other hand, several tactical preparations for conquest were noticeable.

The first of these case histories deals with the destruction on the ground of all but a few of the U. S. Flying Fortresses stationed on the Island of Luzon the first day of war. The story was that a Japanese beer and fruit stand close to the big army air base at Clark Field, north of Manila, kept a watchful eye on activities there. Early Monday morning, Manila time, several hours after word had been received of the Pearl Harbor attack, the Forts took off on a warming-up run. They were awaiting permission from Manila to conduct an offensive bombing mission against the Japanese airfields on Formosa to the north. Permission apparently was not received.

When the planes took off, a radio transmission left this Japanese fruit stand. Another message followed a short time later when the planes returned. Then, with bombs in racks and crews standing by our planes on the ground, enemy bombs fell on the airfield. Clark Field was knocked out of the war without delivering a single offensive stroke!

Had this Jap fruit stand radio said, in effect, to bombers already on their way from Formosa: First, "Hold it, no planes here now," and later, "Okay, gang, come and get 'em"? If so, it performed a great service to the honorable Empire builders, and at little cost to them. This radio set and its operator were discovered and destroyed—but too late.

A few planes managed to get clear of the field by taking off on the first excited cries of warning that preceded the blast of bombs by seconds. Among these few planes was a P-40 piloted by my friend, Lieutenant

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[*] United States Naval Institute Proceedings.

Church, of the Army. Later, *Time Magazine* featured a story of his daring and aggressiveness. With another plane he re-visited Clark Field after it had been occupied by the Japs and strafed a line of parked bombers. He crashed his blazing plane into these as his last heroic and defiant act of life.

The second case history deals with Nichols Field in Manila, where many of the Army medium bombers were based. Most of these were destroyed on the ground Monday night in a full moon bombing attack. An Army aviator we fished out of Manila Bay subsequently told me that just as the bombs started to fall on Nichols Field a couple of MPs ran into the radio house and shot a man at the transmitter key who had been sending dashes on the radio. Presumably the enemy planes came in on this beam. The radioman was in uniform. Whether he was a saboteur spy, or a traitor well paid by the enemy, our friend did not say. The point is that the enemy had made careful plans for this tactical use of radio. It indicates thorough and extensive staff work between the sabotage units in Manila and the Japanese military command. Their plans to make these tricks work were apparently better laid and more skillfully executed than our counterplans to prevent such possibilities. From our ship we watched this spectacular and gruesome sight. First we heard the drone of engines, then we saw the planes pass under the moon a few seconds before bomb flashes came from Nichols Field.

Captain Colin Kelly's subsequent hit on the *Haruna* was the more remarkable because it was made from a survivor plane. How much more costly in Japanese shipping might the Luzon landings have been with attacking American air power measured in squadrons instead of a few lone planes?

The enemy now had complete mastery of the air, with all its advantages, which seemed to superimpose themselves one upon another in algebraic progression.

One case history deals with the destruction of the Cavite Navy Yard by air attack the first Wednesday after war. In this case we credit the Japanese with sabotage organization and military intelligence. Toward the end of the noon hour, Wednesday, December 10, 1941 (Manila date), squadrons of Japanese large two-engined Navy bombers winged their way over Manila Bay and plastered the Cavite Navy Yard unopposed from the air. From the ground they were fired at by obsolete 3-inch guns with no modern fire control. From ships in and near the yard they were fired at by more of the same old 3-inch guns with no fire control at all; and by all stations they were barked at harmlessly by 50-caliber machine guns. It was a beautiful clear tropical noon hour, with blazing sun and not a cloud in the sky. The planes were silver color. When one caught the reflection of sun now and then in a dip or turn, it flashed like a minnow. We counted in each of the first two waves an arrowhead-shaped spear made up of three sections of nine planes each. The third wave seemed to have about 18 planes. One plane from each wave seemed to be a little lower than the rest and trailing somewhat. Subsequently we got to recognize this bird as photo-Charlie.

When the first crash of bombs fell into the Cavite Navy Yard, our fire-fighting parties responded bravely. They rushed into the burning torpedo shop and other dangerous and important buildings still standing. No water came from their hoses to reward their heroic gesture.

Later investigation disclosed that control mechanisms on the water pressure pumps in the pump house had been smashed with sledge hammers. These hammers had been left on the deck near the pumps in mute evidence. No personnel were in attendance when the first trouble-shooter party ran in to see why there was no fire-main pressure. Sabotage squads had done their timely work well. The yard burned on, the flames as unopposed as the bombers had been a few minutes earlier.

The ammunition depot was not hit that day. As this fact became evident with the withdrawal of the enemy bombers, a dozen local Japanese rushed the depot with fire arms and dynamite. Some were shot down by guards who had valiantly stood their ground. The remaining Japs fled. One of the bodies was later identified as that of a barber who had a little shop just outside the navy yard gate. He and his friends apparently had their battle stations and were apparently well drilled in their duties.

No doubt the leading citizens of the local Japanese colony in the barrio of Cavite turned over the evacuation navy yard to the military with full honors incident to the occupation of Manila. We blew up the ammunition depot ourselves before evacuating the area.

This case is representative of Japanese intelligence and sabotage planning in all phases of conquest in the Far East. Similar cases transpired on a grand scale. Our

Captured Japanese photograph showing interned American civilians at the Santo Tomas internment camp near Manila. This camp was liberated by the 1st Cavalry Division.

Official U. S. Navy Photo

British and Dutch allies were victims of equally thorough sabotage organization. The pattern did not differ from the German model used so effectively in the conquest of Europe.

The Japs made certain definite preparations for the Bataan Peninsula Campaign which they knew would be forthcoming. There were caves on the seaward shore of the Bataan Peninsula, beautiful caves which we, aboard passing Navy ships, used to admire through binoculars as we steamed up the coast or anchored in a cove sometimes between target practice exercises. I have passed within a hundred yards of some of these caves in a boat on the way ashore with swimming parties before the war.

Apparently the Japanese had buried mortars, machine guns, and ammunition in these caves at some time before the war. Stores of food, carefully preserved against time and moisture, were apparently buried in this locality also. Some small ravines led up into the jungle from a group of these caves, and in these ravines wells were dug. They had been covered over, and their very existence was a secret.

Some weeks after the Japanese had started their push into the Bataan Peninsula from Manila, they were stopped by the excellent United States Field Artillery units holding positions on high ground covering the flat-land approach from Manila. A battle of fixed positions resulted. To harass our positions from the rear and to create a diversion, the Japanese had landed an estimated 600 specially trained Commando jungle troops on beaches near these caves.

These landings were made secretly at night. The enemy troops dug themselves in, established defensive artillery and machine-gun positions, and set up housekeeping around their wells as the social center of the community. They sent out snipers nightly with food and water rations to last a few days. These snipers went unopposed to positions on trails leading between our various jungle centers of activity. The snipers would take concealment and pick off the end man from behind after a column had passed his position. At the time it was believed that these snipers infiltrated through the front lines at night from enemy positions. Undoubtedly many did; but others were already in our rear, as it turned out later.

The first time this became known was when a naval officer was taking a hike in the country one day from our naval section base at Mariveles Bay, at the seaward tip of the Bataan Peninsula, opposite Corregidor. As he was sauntering along a jungle trail, thinking perhaps of some nice fresh roast monkey, or of the carabao stew he might expect for supper, he was startled by some Japanese soldiers in the trail ahead of him, in uniform and of course fully armed. These soldiers tried to capture our young hero alive, but he made a full power run back along the trail toward Mariveles, with the Japs in pursuit. Failing to capture him, they fired, and missed. He made the best possible time back to the section base and reported the incident. This bit of interesting intelligence was broadcast by voice radio to various Army and Navy units. I heard it on the bridge of my ship in Manila Bay.

A task force was organized consisting of a 12-inch mortar group on Corregidor, an Army officer atop some tall jungle tree on a hill overlooking the ravines as spotter, with walkie-talkie radio; an infantry company of Philippine Scouts; and a U. S. Navy vessel of the inshore patrol. The mortar group lobbed some big ones into the ravines. The Navy vessel poured some 3-inch stuff into the mouths of the caves from seaward, and the infantry closed in to finish off such game as might be flushed from hiding by the above fire. This infantry detachment ran into some pretty stiff fire. So, more artillery pounding was requested. The remaining Japs retreated to the tops of the cliffs and dived to their deaths below. Three hundred Jap bodies were buried when the fighting stopped after several days of stiff resistance from this enemy detachment.

So far as I know the time that these enemy troops landed in our rear was never determined. But the incident brings to mind a conversation I heard one night on the bridge radio. As the Japs were undoubtedly listening in at the time, they must have been aware of how much we knew of the adventure.

One night toward the end of December we were poking around Manila Bay slowly in the pitch dark looking for anything out of the ordinary, when the bridge radio loudspeaker proclaimed in a startled voice that three ships were lying just to seaward of Mariveles Point. Were they friendly, the voice wanted to know? The senior naval officer afloat in Manila Bay said he had no information of three ships that might be there, but that there was so much Allied shipping coming and going, and so many Philippine coastal vessels turning up unexpectedly, that he could not assume them to be enemy without further information. Further information was soon forthcoming from the same voice on the small patrol yacht to the effect that the vessels appeared to be painted with striped camouflage. One of our ships was directed to verify the whole thing at dawn. There was nothing in sight in this area at dawn, of course, so the whole matter was dropped. Looking back on this conversation, I believe that the Japanese troops may have been landed that night.

The uniform of these enemy troops showed forethought, planning, imagination, and good practical common sense. One of these jungle sniper uniforms was on display at Mariveles later. It was of jungle green, with streaks and blotches of different shades. The shoes had a superimposed undersole shaped like the hoof of the wild carabao, indigenous to the Philippines. Such marks in a sandy brook bed were not of themselves cause for alarm. After the sniper had climbed his tree, he would pull a green mosquito netting over his body and most of the rifle. This increased the camouflage and afforded mosquito protection.

Our most successful defense against these Japanese jungle snipers was found to come from Moro warriors from the southern Philippines. These wild men of the jungle wore a G string and a long knife for their uniform. One of these invaluable allies would stalk a Jap sniper. It might take half the day to locate him even after arrival in the area of the last sniper attack. Then the Moro would noiselessly glide to a tree near the one holding the Jap, would climb it barefoot to near the top, climb out on a limb and drop to a branch of the desired tree. He would then adjust his position noiselessly until he was on a limb over the prone Jap, and would then fall on him with his knife. A few Jap prisoners taken on Bataan professed great distaste and fear of these Moro tactics.

Japanese tourists, geographers, fishermen, farmers, and photographers were legion out there. They were everywhere, sticking their noses into everything. They must have had access to about every picture (except military) taken in the Far West in general and the Philippines in particular. Photo-information ran the gamut from the large Rising Studio (why leave out the "sun"?) in the resort town of Baguio in Luzon, where everything was Japanese from ownership on down, to the usual run of Manila photo shops. These latter usually had either a chemist, or clerk, or bookkeeper, or messenger boy from the Japanese colony—at least, somebody in the organization somewhere to snag off an extra print of a strategic picture of whatever might come up from time to time.

The Japanese military staff work in preparation for the invasion of Luzon must have been thorough, accurate, and realistic. No obvious flaws were apparent. They did exactly what we expected them to try to do, and in the conventional sequence:

(1) Destroyed local American air power the first day of war.

(2) Continuous bombing of shipping in Manila Bay from the second day on.

(3) Established beachheads at Legaspi, Southern Luzon, and at Linguayan to the north, with the greatest early show of strength south in an attempt to divert and confuse our ground forces (dates not certain).

(4) Destruction of Cavite Navy Yard third day of war.

(5) Support of beach positions by the arrival of eighty transports at Linguayan and forty at Legaspi. The invasion was now on.

These scenes of Japanese landings were exactly where we had thought them most probable, and where *Time Magazine* some months before war had predicted they would be because of the flat low country between these sites and Manila.

The first hostile action against the Philippines was many hours after we had got word out there of the treacherous attack on Pearl Harbor. What, then, is the answer? Supposedly when two commanders appraise each other, they make plans which will checkmate any foreseen attacks of the adversary. Unforeseen attacks, then, become the ambition of a military commander. This is reflected in the adjective of the expression to achieve surprise.

Since there was no surprise in the opening phases of the Philippine campaign, and no unforeseen attacks developed, what explains the tragic blunders we made out there, resulting in a plight where the heroic last stand of Bataan and Corregidor became necessary? One answer might be that the Japanese achieved surprise in the Philippines by destroying the air and sea forces of our great advance base at Pearl Harbor. That answer stands up only if you believe that had Pearl Harbor *not* happened, the air force and ships there destroyed could and would have relieved the garrison on Luzon. But how? The Marshall and Caroline Islands were fortified, and American amphibian power was still in the planning stage at the time.

Are we to judge that Japanese preparations for the Philippine campaign included a more accurate and realistic appraisal of the situation than ours? Did the Japanese arrive at a correct estimate of the situation when they planned on being able to destroy American air power on the ground the first day at the Luzon bases, instead of figuring on our air power destroying them on the ground at their Formosa bases? We have discussed a few of the Japanese material preparations, realizing that there were many more that we have not mentioned. It is obvious that their mental preparations were equally realistic. Were ours?

Wreckage at Cavite Naval Station near Manila. Japanese saboteurs ashore gave all possible aid to the bombing compatriots. This is a scene after the first Jap blows in December, 1941.

Official U. S. Navy Photo

Return of the National Pistol and Small-Bore Matches

by Leonard J. Grassman

BACK on the sports stage after a wartime of more businesslike shooting, the nation's marksmen finished their first postwar National Pistol and Small-Bore Matches at Camp Perry, Ohio, early in September. About 1,000 keen-eyed contestants lined up along the two-mile Perry firing line and burned up over a million rounds of small-caliber ammunition and perforated target bull's-eyes all the day long from August 31, through September 8, firing the multiple shot which heralded the return of a greatly expanded and invigorated American sport.

Purpose of these matches is not to dispose of surplus ammunition but to provide a national benefit in addition to supporting a great sport and a nerve straining test of individual skill. The benefit, rarely apparent in peacetime, is obviously present when our nation is threatened by war. Our national marksmen became the teachers of our adaptable but rusty citizenry at the outset of the emergency which preceded the late war, and the National Rifle Association provided training films and expert gunnery instructors who taught the expert use of small arms to the officers and men who later became the small-arms instructors for our armed forces.

Early in the century, when the rifle and pistol ceased to be essential tools of daily life and their possession became a matter of law, the marksmanship of Americans had declined greatly from the standards of the famed frontier shooting. The War Department, always aware of any threat to National Security, decided some precaution should be taken to preserve at least a nucleus group of skilled marksmen to train our fighting forces in the event of future emergencies. To accomplish this, the National Board for the Promotion of Rifle Practice was formed. The Board, composed of twenty-one members appointed by the Secretary of War from representatives of the War and Navy Departments, the Army, Navy, Marine Corps, National Guard, Organized Reserves, National Rifle Association, and the country at large, has for its president the Under Secretary of War. The present board, in addition to its president, the Honorable Kenneth C. Royall, is composed of General Courtney H. Hodges, Commanding General of the First Army, War Department representative; Captain Clifford H. Duerfeldt, Navy Department representative; Major General B. B. Miltonberger, Chief of the National Guard Bureau; Major General E. S. Bres, Executive for Reserve and ROTC; Major General Milton A. Reckord, Adjutant General of the State of Maryland and Executive Vice President of the National Rifle Association; Colonel Emerald F. Sloan, USA (Ret), Director of Civilian Marksmanship, Executive Officer of the National Board; Colonel Christian H. Clarke, Jr., representing the Director of Organization and Training, War Department General Staff, and Colonel Joseph K. Bush, Army Ground Forces.

Interest in such skill had originated in Europe but as an organized sport it is primarily American. In 1871, the National Rifle Association of America was chartered in New York. A great part of its membership was composed of members of the civilian National Guard Units of a number of States. In 1903, the Office of the Director of Civilian Marksmanship was set up in the War Department with appropriations and authorization to provide certain War Department equipment to civilian rifle clubs which had been organized in accordance with regulations approved by the National Board for the Promotion of Rifle Practice. The Director issues Army Qualifications Badges to civilians, also. Because of his close association with the activities of the National Board, the Director of Civilian Marksmanship is normally appointed as Executive Officer of the National Board. Present Director is Colonel Emerald F. Sloan, USA. He and the Assistant Director, Lieutenant Colonel Paul F. Roberts, Inf., have had a great deal of experience in working with the National Guard, Reserves, and civilian riflemen, and are always available for information on organization of rifle clubs and procurement of government materials for such organizations. Three classes of applicants which may receive such assistance are schools and junior and senior rifle clubs organized for target practice.

Schools, in order to receive the benefits, must maintain during the entire school year a uniformed corps of cadets, at least 40 in number, above the age of 14 years. They must have an adequate course in military training and must conduct target practice in accordance with the regulations prescribed by the Board. Targets, rifles and ammunition in certain specified amounts are authorized for issuance. Senior rifle clubs may receive similar benefits by enrolling with the Office of the Director with a membership of at least 10 physically fit male citizens above the age of 18. They must not be eligible to receive federal aid for such activity from any other source and must maintain affiliation with the National Rifle Association and must carry out target practice as prescribed.

Junior rifle clubs have pretty much the same stipulations but must be under the sponsorship of an adult, responsible, male citizen, and have proportionate marksmanship qualifications and courses. In order to receive the issue of nonexpendable equipment all such organizations must furnish a surety bond, provide for secure storage of equipment, pay all transportation charges and have suitable range facilities. They must also submit at the close of each calendar year an annual inventory of U. S. property and an annual report of firing.

Contemporary interest in the use of small arms has been stimulated by personal experiences in the armed forces during the war, by enlarged gunnery and sporting clubs, by preparedness-minded organizations, schools and other such units. It is anticipated by the small-arms enthusiasts that the sport will be greatly enlarged and more popularly received in the future.

The first of the National Matches was held at Sea Girt, New Jersey, in 1903. The Matches of 1905 and 1906 at the same location. The 1904 Matches were held at Fort Riley, Kansas, and in 1915 and 1916, they were conducted at Jacksonville, Florida; in 1919, again in New Jersey, at Caldwell. All other matches have been held at Camp Perry, Ohio; the first in 1907 and the last in 1941.

In the first matches, participation was limited to teams from the regular services and the State National Guard organizations. The National Individual Rifle and Pistol Matches were inaugurated in 1904 with 187 entries in the rifle and 38 in the pistol. With the passage of the National Defense Act in 1916, participation of civilian teams from each state was authorized and a Small-Arms Firing School became an important part of the National Match Program. The National Pistol Team Match was inaugurated in 1920 with 36 teams firing. In 1939, there were 128 entries in the rifle team match, 33 in the pistol team competition and 2,037 in the National Individual Rifle Match and 622 in the National Individual Pistol Match.

The National Championships of the National Rifle Association have been an important part of the National Match program from the beginning. In 1940, there were 91 NRA matches.

The National Matches sponsored by the War Department consist of the National Trophy Rifle Team, the National Trophy Individual Rifle, the National Trophy Infantry Team, the National Trophy Pistol Team, and the National Trophy Individual Pistol Match. Many new matches have been created for this year's and subsequent matches. During the 42 years since the adoption of the National Matches, numerous Trophies have been accumulated and these trophies are presented to the winning teams or individuals who usually retain possession of the original trophy for one year and are given a miniature replica thereof for their permanent possession. The contestants also fire for small money prizes.

Marksmanship as a sport is comparatively low cost after the initial outlay for equipment, which, in itself, isn't great. It is a family sport in which all members of the family regardless of sex may indulge. It is an ideal week-end sport, and bows neither to weather conditions nor season since there are ample facilities practically everywhere in the nation for indoor and outdoor shooting. It is a sport of skill and a test of temperament, granting great satisfaction.

Through the years it has swept a long way from the career soldier's bivouac but still remains the most engaging sport for regular and reserve officers who maintain a man isn't a soldier unless he can shoot, and military men have long and successfully competed on the range, individually and in civilian or military teams.

Now, as the interim Army is more settled and officers are becoming accustomed to their newest assignments, military teams are springing up on a large number of camps and posts, and military activity in the field of marksmanship contests promises to be greater than ever.

The same picture is true for the civilian side of the picture. Veterans, loath to set aside the skill in shooting attained in service, are either joining or forming marksmanship organizations. Although this year's match was the greatest in the history of the National Matches, shortage of housing facilities and difficulties in transportation, and costs have prevented it from being as great as it might have been. In the next few years, when such limitations are removed, the National Matches are expected to claim numbers as great as other national sports.

This year's match produced some remarkable scores despite the rust collected through lack of target practice during the busy war years. Arthur Cook, 18-year-old youth from the District of Columbia, won the junior small-bore rifle championship at Camp Perry with a 1,582 score. One of two 18-year-olds to make the Dewar international team (teams competing from the English speaking countries) this year, Cook beat out John Kelley of Fort Worth, Texas, who had a score of 1,580. The national small-bore title went to G. Wayne Moore of Washington, Pa., who used a borrowed rifle to post 3,184. The pistol championship title went to Harry Reeves, a Detroit policeman who attained the highest score ever posted at Camp Perry. He scored 2,588.

Such shooting as this places the famed marksmanship of our Daniel Boones and Dead-eye Dicks of our more romantic pioneer days in a rather amateurish light by contrast, and as the fever for the small arm spreads from our present 500,000 marksmen into the millions, our nation will have no fear about a shortage of teachers in expert marksmanship in the event of a future emergency.

AGF Outlines Organized Reserve Training Program

ARMY Ground Forces has outlined a two-year training program for the Organized Reserve Corps, which makes the AGF not only responsible for the training of the Infantry, Armored Cavalry and Artillery, but also for the training of units of the technical services which would ordinarily be attached to a field army.

The program provides for the training of Signal, Infantry, Airborne Infantry, Armored Infantry, Field Artillery, Tank Destroyer, Armored Cavalry, Antiaircraft Artillery, Seacoast Artillery, Military Police, Engineer, Chemical, Medical, Ordnance and Quartermaster units, for ORC bands and for Order of Battle and Photo Interpreter teams.

They are based on a minimum of 50 home or "armory" training periods annually, of two hours each. Field training will consist of a 15-day period annually, but since such training is not planned until 1948, a field training program will be issued at a later date.

The programs are outlined to provide refresher training, initially, in basic subjects, followed by progressive training in tactical and technical subjects. All units will receive instruction in such basic subjects as administration and mess management, first aid, chemical warfare, customs of the service, dismounted drill and ceremonies, domestic disturbances and martial law, intelligence, signal communication, map and aerial photograph reading, methods of instruction, military law, organization of the Regular Army and Organized Reserve Corps, protection of military information, censorship, psychology of leadership and utilization of training aids.

This training will be followed by technical and tactical subjects of the particular arm or branch, including logistics, motor vehicle operation and maintenance, air-ground liaison, the artillery-infantry-tank-engineer team, military history, map exercises and maneuvers, staff procedure, supply, terrain appreciation, weapons, tactics, amphibious operations and specialist training. Advanced training for a limited number of specialists will be conducted by means of special courses at service schools.

Tables of allowances of equipment for home training of the Organized Reserve Corps have been approved by the War Department, and units will be able to begin drawing their equipment as soon as adequate facilities for its maintenance and storage are procured, General Devers stated.

The tables of allowances published thus far cover equipment for home training of ORC Chemical, Antiaircraft, Engineer, Field Artillery, Infantry, Medical, Ordnance, Quartermaster, Signal, Finance, Special Services, Counter Intelligence, Order of Battle, Photo Interpreter, Transportation Corps and Airborne Infantry units. Virtually all organic equipment of each arm, branch and specialty is made available, plus necessary Air Forces, Chemical, Engineer, Medical, Ordnance, Quartermaster, Signal and Transportation equipment.

The amounts of equipment authorized vary with the class of unit, whether A, B or C. Class A units are organized at full strength of officers and enlisted men, and will be as fully equipped as possible. Only essential individual and training equipment will be furnished Class B units, organized with full officer strength and enlisted cadres, and Class C units, with full officer strength only.

To alleviate problems of maintenance and storage, only 25 per cent of authorized vehicles will be issued, and 25 per cent of specialized equipment such as artillery pieces, heavy engineer equipment and tanks. Such heavy equipment will be issued to Class A units only, except in the case of Class B Field Artillery battalions, which will be issued one appropriate artillery piece. Normal engineer, ordnance, chemical and quartermaster equipment which accompanies vehicles will be issued on a one-per-vehicle basis.

In addition to individual arms and equipment, which will be issued to all members of Class A and B units, and uniforms, which will be issued to all enlisted members of the ORC, many specialized items of equipment available from World War II stocks will be furnished for home training purposes.

Senior ORC instructor's offices in each state are allocated training aids and motion picture projectors, and are a source of combat and training films for ORC units. The Signal Corps has already produced one film especially for ORC use, "United," Miscellaneous Film No. 1267, an 11-minute subject designed to stimulate enlistments in the Organized Reserve Corps.

* * * *

Book Reviews

TOUR OF DUTY. By John Dos Passos. Houghton Mifflin Company. $3.00.

John Dos Passos, one of America's most sensitive and talented reporters, tells an engrossing and important story of Americans in action against a background of the whole wide world. His book, told in terms of incident and human anecdote, poses the life-and-death problem America faces today: How to carry over into the postwar world the miracle of our wartime effort and virtue.

In *Tour of Duty* you will travel by plane, battleship, foot and jeep from Pearl Harbor to the Philippines, from Paris to Berlin. You meet the matter-of-fact courage of the guerrillas and learn details of their incredible lives.

Dos Passos is not presenting a personal point of view in *Tour of Duty*. He preaches no sermon. He is observing and reporting. Those on the spot do the talking. Their dialogue emerges with a seeming stenographic quality. Their talk emphasizes with mule-kick force the momentum we have lost in peace, but enjoyed in war.

* * *

BEHIND THE IRON CURTAIN. By William Van Narvig. Ziff-Davis Publishing Company. $3.00.

In this book, in more than 50 chapters, the author covers every phase of Russian life, intimately and in detail. First he talks of the Russian family group, the party, the secret police, the farms, industry, labor unions, the press, black markets, the democratic concept and its meaning to Russia.

The second half of the book is presented as though written by an average Russian and tells his outlook on Russia and the rest of the world—how he feels; what he knows; what he has been taught; and, consequently, his reaction to everything from his belief that Russia alone won the war to the atomic bomb, the veto, and the United Nations. This is a book neither sympathetic to, nor critical of, the Russian people. It is completely realistic and it is vitally important, because it will help the people of the Western world understand the reasons for the average Russian's views.

William Van Narvig was born in Russia, and more than 25 years of his life have been spent inside Russia—as a student, as a soldier, as a government employee, as a businessman. He is a citizen of this country and served in the U. S. Army Intelligence as a Lieutenant Colonel during World War II.

* * *

OPERATION LIFELINE. By James Lee with photographs by Joe Rosenthal. Ziff-Davis Publishing Company. $5.00.

This is a non-fiction book that tells the story of NATS —the Naval Air Transport Service—one of the Navy's most vital arms both during and after the war.

The NATS served as the Navy's lifeline in the Pacific after Pearl Harbor and went on to play an ever-increasing role in the rapid movement of the men and supplies in this theater of operation.

Operation Lifeline brings the whole story together for the first time. It gives the details of the organization, the routes flown, equipment used, the technique of operation, and the importance of the NATS in the development of air transportation of the future.

This is one of the great stories of accomplishment to come out of the war and a tribute to the planning, coordination, and ability of this branch of the Navy's air arm. It it an engrossing account, with much information heretofore unpublished, and profusely illustrated with many fine pictures.

James Lee, Washington correspondent for International News Service, gathered the text material for this book on the scene by invitation of the Navy. Joe Rosenthal is famous as the Associated Press combat photographer who photographed the Marines raising the American flag on Iwo Jima.

* * *

THE BATTLE OF GERMANY. By Lieutenant Theodore Draper with maps and drawings by Sergeant Walter H. Chapman and a Foreword by Major General A. R. Bolling. The Viking Press. $5.00.

This history of the 84th Infantry Division is the first divisional history to be accorded the recognition of publication by a general publisher. Hundreds of details not told in press reports are included in this excellent history, which is illustrated with more than 100 photographs.

It is a book that every military reader will want to own. It is the story of war as a fighting man sees it.

The 84th Infantry Division in

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Hanson W. Baldwin, N. Y. Times Book Review

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Tour of Duty

By JOHN DOS PASSOS

A story of Americans in action against a background of the whole wide world.

$3.00

CHILDREN OF YESTERDAY. By Jan Valtin. The Readers Press. $3.00.

As Private First Class Clarence Krebs, Jan Valtin was a member of the Public Relations Office of the 24th Infantry Division during the division's action in the Philippines. He and Captain Lloyd Price, *Dallas* (Texas) *News* reporter and Public Relations Officer of the 24th Division, conceived the idea of writing a history of their division's combat action. Out of this came the now popular seller *Children of Yesterday*. Entitled "Japs Die Hard" at first, the entire royalties of the book are to go to the 24th Infantry Division Association.

This book is the story of the men of the 24th Division who fought the war in the Philippines. Hundreds of them are mentioned by name.

Vivid descriptions of the combat actions on Leyte, Mindanao, and Corregidor are to be found in the book's pages. It is a book worth reading.

* * *

A PRIMER OF HORSEMANSHIP. By Sanford Cummings. The Marcel Rodd Company. $1.95.

A Primer of Horsemanship is intended to fill more adequately than any other book previously available the constant demand for a complete "set of rules" to the sport and art of riding, and to give the reader in handy question-and-answer form all the information he could possibly need as to the care and handling of riding horses and the choice, care, and nomenclature of all riding equipment. The volume is divided into three sections—the horse, the rider, and how to ride a horse. An internationally known sportsman and a former instructor at the Cavalry School, Mr. Cummings is a recognized authority.

* * *

THE BASIC MANUAL OF MILITARY SMALL ARMS. By W. H. B. Smith. The Military Service Publishing Company. $5.00.

The enthusiastic reception given the first editions of this book by the military journals, civilians, soldiers, newspapers and magazines immediately established it as the unique small-arms handbook.

It covers more than 100 weapons in detail, showing specifically in over 500 action-photos how to load, operate and strip the infantry weapons of the world powers. The text is plain and easily followed. The only way you could get the mass of information packed into this book would be from scores of manuals—many of them unobtainable.

AS HE SAW IT. By Elliott Roosevelt. Duell, Sloan & Pearce, Inc. $3.50.

In informal style, this book presents the story of Franklin D. Roosevelt's thinking and of the aims behind the conferences that shaped the policy of victory and set up the framework of the peace organization to follow. Based upon discussions, unpublished correspondence, firsthand observations and, above all, intimate talks, it discloses a great number of new and extremely interesting facts about the late President, his opinions of the other great leaders, his ideas, and his plans for the future role of America in the world.

It covers the period from the Atlantic Charter meeting in the Atlantic to the Yalta Conference and after. Elliott Roosevelt acted as his father's aide at all of the important Big Three conferences except Yalta, and because his father wished to talk freely with a member of the family when the long days of work were done the son was given a unique opportunity to see behind the scenes of those history-making meetings. He was able to observe world leaders, such as Churchill and Stalin, in their relaxed moods as well as their formal poses, and the sidelights this record throws upon such figures are often astonishing. In writing this book, filled with warm understanding and loyalty to his father's aims, Elliott Roosevelt has performed a service for which countless Americans will be grateful.

* * *

YANK: THE G.I. STORY OF THE WAR. By the Staff of *Yank,* The Army Weekly. Duell, Sloan & Pearce, Inc. $5.00.

This book, in preparation since V-J Day, tells the soldiers' own story as reported by soldiers from start to finish—from Pearl Harbor to V-E Day and the Japanese surrender, and on into the occupation and demobilization period.

Here for the first time since wars began, soldiers themselves have put down in powerful, simple language and captured in memorable pictures the complete story of the war. In this dramatic chronicle of the war, GIs have told about all the things they endured during the years they were away, but rarely talk about now. It is all here—Guadalcanal, Sicily, Italy, New Guinea, France, Luzon, Iwo Jima, Germany, and Japan—the story, in warm human terms, of the individual soldier who shaped history and how he reacted to the tremendous events around him.

The book is illustrated with hundreds of action photographs, on-the-spot drawings, and a few appropriate cartoons.

No part of this new book appeared in the anthology of stories, humor and cartoons entitled *The Best From Yank.*

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BE A BETTER HORSEMAN. By Captain Vladimir S. Littauer with 230 photographs by Bert Clark Thayer. Duell, Sloan & Pearce, Inc. $7.50.

This is a new popular edition of a book radically different from any work on horsemanship previously published. Captain Littauer, the "teacher of teachers," provides the first really simple, practical and complete book on riding; a book for the whole family—a book for men, women and children.

* * *

IRON OUT OF CALVARY. By Walter Phelps Hall. Appleton-Century Company, Inc. $4.00.

Here, in a single compact and readable volume, is the full military, political and social history of the war just ended. It is a clearly written history with a realistic viewpoint.

* * *

PAPER BULLETS. By Leo J. Margolin. Froben Press, New York. $2.50.

Lots of hot and cold moving steel, thrown at the enemy at the right place and time, has been the traditional way to win wars. It still is. But *Paper Bullets*, the first story of combat propaganda in World War II, tells how hot words and ideas, thrown at the enemy at the right time and place, shortened World War II by many days, thus saving countless American and Allied lives.

War, the author points out, is also hurling ideas at the enemy, prospective or real. War is also in the minds of men as much as it is on the battlefield. In fact, Mr. Margolin, a veteran newspaperman turned propaganda expert, proves that psychological warfare (the fancy word for propaganda) has won and lost wars before a single shot had been fired.

Mr. Margolin vividly relates the propaganda moves leading to World War II. Quite obviously America was as unprepared for war mentally as it was militarily. The chapter "Germany In America" is exciting reading, as is most of the book, but it is a shameful chapter in American history. How a "savvy" America could have allowed the Germans, their Bunds, their propagandists and their spies, to have literally stepped all over America, is not something most Americans would like to remember. But read it we must and its lesson must be taken to heart.

Mr. Margolin served with the Psychological Warfare Branch of Allied Force Headquarters in the Mediterranean for sixteen months. He views the workings of propaganda from the watchtower of a man who has seen this deadly weapon work before, during and after hostilities. In writing *Paper Bullets* he has done a great service to the professional soldier and the civilian.

THE BRERETON DIARIES. By Lieutenant General Lewis H. Brereton. William Morrow & Company, Inc. $4.00.

This is the story of the War in the Air in the Pacific, Middle East and Europe; 1941-1945. It is the frank and uncensored day-by-day account of the war as seen by General Brereton, long-time champion of air power. This is the first blow-by-blow story of the war by a top-flight air general who saw action in all the major theaters of operation.

The Brereton Diaries is a confidential and amazingly revealing account of General Brereton's exploits and observations from October, 1941 to V-E day; of the amazing growth of our air forces—from only 33 heavy-bomber crews trained for combat in October 1, 1941, to the most overwhelming airforce in history. In the book General Brereton tells why the War Department did not expect war with Japan until April, 1942.

* * *

70,000 TO 1. By Quentin Reynolds. Random House. $2.50.

Lieutenant Cordon Manuel of the 64th Squadron, 43d Bombardment Group, bailed out at 300 feet above the water, five miles off the coast of New Britain, with one leg broken and the other full of fragments. In this book Mr. Reynolds tells Lieutenant Manuel's story in an exciting narrative.

The book shows through the experiences of Lieutenant Manual what a man can do in a tight spot if he will keep his head. It is a book of valuable reading for every member of the armed forces.

* * *

WE CAUGHT SPIES. By John Schwarzwalder. Duell, Sloan & Pearce. $3.00.

Major Schwarzwalder has done a capable job in turning out a book that describes the activities of the Army Counter Intelligence Corps. He tells how enemy agents were caught and their plans upset. The book is full of actual cases that give the reader a real insight into the workings of CIC men.

* * *

A TRIAL ON TRIAL. By Maximilian J. St. George and Lawrence Dennis. National Civil Rights Committee. $5.00. The story of the Great Sedition Trial of 1944.

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MAVERICK TOWN: THE STORY OF OLD TASCOSA. By John L. McCarty. University of Oklahoma Press. $3.00. The story of romance and danger in the old West.

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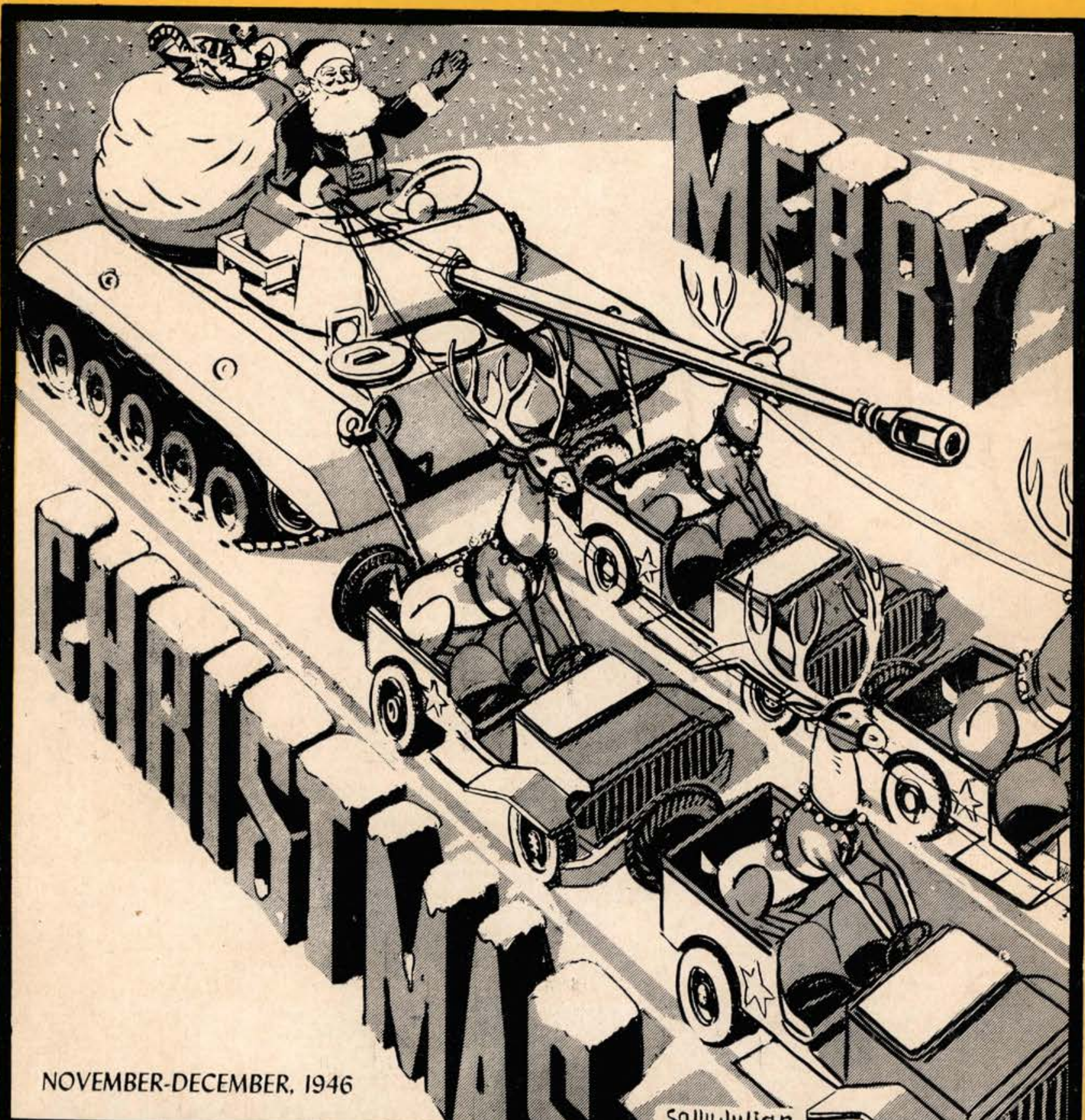
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1st Cav. Div. Photo

A First Cavalry Division armored car passes a reviewing stand in Tokyo. This highly mobile vehicle is effective in breaking up riots and demonstrations.

CAVALRY'S IN J

by Colonel Charles

An area three times the siz Honshu Island is occupie sion. In this informative a Sheldon, Chief of Staff of unit's occupational metho

WHEN occupation forces in Europe and the Philippines began to realize that the post-hostilities rush for the home fires would not be soon as they anticipated, they gave vent to their feelings in bawdy "we wanna go home" meetings which bordered on mutiny and did little, except menace the good impression laid by American troops during the early phase of the occupation. To combat this feeling of depression and to further security measures, the War Department created a new Armed Force—the Constabulary, in Germany—a mobile group of 32,000 hand-picked officers and men known for their levelheadedness and physical impressiveness.

The occupation force in Japan needed no such disciplinary force for there had been no flagrant exhibitions or mass disorder. Instead, the Eighth Army came to Japan already prepared for the job of disarming and impressing the defeated Japanese. Spearheading the way into Japan minutes after the surrender document was signed, sealed and delivered aboard the U.S.S. *Missouri* in Tokyo Bay, 12,800 crack troopers of the First Cavalry Division quickly entrenched themselves under the scales of a still potentially powerful but writhing dragon. After adding "First in Tokyo" to its long list of firsts (Manila, Tacloban, etc.), the First Cavalry Division settled down to the long, arduous task of pulling the dragon's teeth.

Securing a firm grip on Japan's nerve centers (Tokyo-Yokohama) the First Cavalry Control spread out until its scattered units now sprawl over one-third of vital Honshu Island like a giant octopus. When other units deactivated, the First Cavalry carried on the job, and today it controls ten Prefectures, an area of approximately 23,600 square miles (three times the size of New Jersey), having a population of more than 12 million. Everywhere in Tokyo, the once-proud metropolis, one sees the yellow and black of the Norman Shield shoulder patch with its bar sinister, and horse's head. All roads no matter how small lead to a Cavalry installation sooner or later.

Major General William C. Chase, renowned leader of the "Flying Column," which made the daring dash to Santo Tomas to free 3,700 internees, is the Commanding General of this Division. Two of the Division's four Regiments, the Seventh and the Eighth, are stationed in downtown Tokyo. The Second Brigade's headquarters is located at the Imperial Guard Barracks. One squadron of the Fifth Regiment is stationed in Camp Drake, Asaka, 12 miles from Tokyo—formerly a formidable Japanese Military Academy, but now the site of the Division Command Post. Special troops (Quartermaster, Signal, Reconnaissance, Tank, Ordnance, etc.) comprise the rest of the post. The Division's four Field Artillery battalions are concentrated near Ojima, on the southern tip of Gumma Prefecture approximately eighty miles from Camp Drake. However these battalions have outposts in neighboring prefectural towns: The 61st at Ota, the 82nd at Miizugahara, the 99th and 271st at Koizumi.

After months of tedious work amidst the humid throngs of Japan's cities, Allied personnel are privileged to visit rest hotels (former Japanese resorts, mountain and seaside, famous for their hot springs, beauty, and above all, tranquillity). Scenic Nikko, beautiful, rich in culture and center of Japan's shrines, is foremost among these resorts. Men of the First Cavalry's Field Artillery battalions patrol this area and do Military Police work with the least amount of friction. Additional troops can be called for similar work here if necessary.

Military Government units are stationed in distant, but strategic towns. Other "line troops" are posted in the near-by Yokohama area. Each regiment consists of two squadrons, having a headquarters, weapons and three line troops. In addition to these two squadrons, each regiment has a separate Regimental Headquarters Troop plus a Service and Cannon Troop.

★Chief of Staff, First Cavalry Division.

FIRST TEAM
APAN

*A. Sheldon, GSC**

e of New Jersey on Japan's
d by the First Cavalry Divi-
rticle Colonel Charles A.
the division, explains the
ds and policies.

1st Cav. Div. Photo

First Cavalry Division troopers keep in shape by undergoing a regular training program. Here a group of cavalrymen are working out a tactical problem.

Tokyo is divided tactically, rather than by the old Japanese method of "Kus and Wards." The Second Brigade is in charge of Tokyo City which is divided into four squadron sectors. These sectors are then divided for the unit's convenience. Following certain Ku boundaries is inevitable because it facilitates close contact with the Japanese Police.

But perhaps the most outward sign showing the presence of the Cavalry in Tokyo is the massive parades and display of armed might. The ever-colorful Cavalry parades emphasize mass formations of foot troops, followed by endless columns of rumbling tanks, recon-cars and Artillery. This makes a sound impression on the Japanese people whose lives have been based on respect and admiration of power. Besides impressing the Nipponese, the parades have dual purposes—increase "esprit de corps" and general morale among the troops and to honor visiting dignitaries. Parades including more than 3,000 men were staged in honor of former President Hoover, General Dwight D. Eisenhower and more recently for the six-man Congressional party. The site of the parades—the sprawling Plaza of the Imperial Palace Grounds—adds a touch of "we-mean-business" to the whole affair.

The First Brigade is composed of the Fifth and the Twelfth Cavalry Regiments with headquarters at Otawa. The first squadron of the Fifth Regiment is at Camp Drake, while the second is at Fuchinobe. The Twelfth Cavalry headquarters is at Otawa too. Their first squadron is at Haratsuka and the second is at brigade headquarters.

In Kanagawa and Shizuoka Prefectures there are a number of beach resorts and this area is also patrolled by alert troopers of the First Brigade. Foot patrols and lifeguards are present at every authorized swimming beach for safety and also to keep the Japanese G-string mermaids and men out of our area, and vice versa. Kamakura beach (the French Riviera of Japan) is probably the most extensively visited. Paramount duty of the guards and patrols in this area is to enforce existing restrictions and insure the safety of our men.

The First Cavalry Division operates independently of CIC and CID units but is always in close liaison with them. Either party notifies the other in case of disorder, or when certain "leads" come in. It was "The First Team" that helped locate the gold, silver, and platinum hoard that was hidden in Tokyo Bay by the Japanese before surrendering. The Cavalry to date has destroyed 30,895 tons of Jap ammunition, 3,500 artillery pieces, 100,000 rifles, thousands of swords, etc. Hidden treasures are still being recovered from Japanese installations—especially precious industrial metals. Tips about these hidden stores come from many and varied sources, but the most reliable are from Japanese informers who are closely investigated.

The returning Japanese soldier is a constant source of danger because they were fed an overdose of propaganda and indoctrinated to a certain code of life characterized by their method of suicidal warfare. However, they have caused no alarming problem. Instead, they seem to mingle with the common mass and be lost in its surging tide.

With the revival of its population from near-serfdom to free men, the Japanese labor parties are gaining momentum. Frequently, marches and massive demonstrations are held by thousands of irate groups.

These gatherings, no matter how large, are surprisingly orderly.

The duties of the Cavalry Division do not interfere with the work of the Japanese Police unless the offense involves Allied Personnel. Japanese Police are now armed. They have no powers over GIs but there have been no reports of tension between GIs and the Japanese Police Force. Their primary duty is traffic in so far as the occupational force is concerned. Though the Japanese Police do not hold the position of Demigods which the "Kempei-Tai" (thought police) held, the people respect them.

The "Korean Problem" is becoming less and less a real issue because most of them are being repatriated. The mutual hatred between the Koreans and Japanese has at times broken into full scale riots but the Cavalry patrols have quelled such disorders. Whenever these demonstrations of feelings are in large scale, strategically placed, highly mobile armored cars appear on the scene —(thanks to the two-way radio sets in all patrol vehicles). The "Hot Spot" of these demonstrations was Tokyo's notorious Shimbashi area—the scene of a bustling black market ring, predominantly headed by Koreans.

The food situation may aptly be described as critical in Tokyo but it is not a source of many law violations. Hunger contributes to many petty thefts from occupational forces. There have been several (peaceful) food demonstrations just after the crucial period following the first winter. There was never once a food riot. SCAP has done a fine job in releasing foodstuff to the hungry, thus saving thousands, much to the appreciation and humble gratitude of the people. Statistics show that more people moved into the country, rather than from the country into the city. This trend was probably instigated by the knowledge that more food was to be had in the outlying farm districts.

Housing is a minor problem for the millions in Tokyo. They can throw together a few pieces of lumber, mud-plaster and remnants of bombed out buildings to have a home acceptable to the low living standards of the Oriental.

First Division Cavalrymen are getting regular training as combat troops, and also attend classes in basic Japanese language. Each unit of squadron level maintains its own noncommissioned officer school with classes in relations with civilians and MP work. Modern firing ranges and fields for working tactical problems are available to every regiment.

The population was "deloused" with DDT, and to this is attributed the small percentage of sickness or epidemic among the conquerors and the conquered.

Since the beginning of this occupation each regiment has been required to designate one troop as MPs and they work through the Division Provost Marshal. Their chief job is to regulate traffic on the crowded thoroughfares of Tokyo, enforce speed regulations, prevent black market, help the Division Surgeon in the control of venereal disease and provide escorts for visiting dignitaries.

The occupation is extraordinary in that no disorders are encountered, and it seems assured that the success of this occupation is a surety now. Today, more than a full year after storming the beaches, they are vigorously enforcing "law and order," looking for potential "leads" and at the same time teaching the defeated people through actions the ways of Democracy and Peace—a much more enlighting way of life.

AGF SETS UP TWO GROUPS IN G-3 SECTION

Two major groups—one for training and the other for operations—have been created in a reorganization of the G-3 Section, Headquarters, Army Ground Forces, General Jacob L. Devers, Commanding General, announced recently.

The work of the G-3 Section has been materially increased in recent weeks by the inactivation of the Replacement and School Command, the assumption by AGF of responsibility for the recruit training of all Army enlisted personnel except those going to Air Forces and increasing responsibility by AGF for the organization and Training Group. This group will handle Schools, Replacement Training, Troop Training and Civilian Components.

The Operations Group will handle Operations, Organization and Equipment, and Training Publications and Aids.

First Cavalry Division

CARDED

by Major Hal D. Steward

A FIRST CAVALRY DIVISION trooper once remarked, "After all, everybody knows that 'First' means 'Number One'."

Being first was the keynote of this famous Cavalry division all during World War II. It stacked up an unsurpassed number of "firsts" in its battles against the Japanese in the Southwest Pacific.

Some of the First Cavalry Division's most outstanding "firsts" include capturing the first island capital city on the return of the American forces to the Philippines—Tacloban of Leyte; capture of the capital city of the Island of Samar—Catbalogan; first American unit to enter Manila, capital of the Philippines; and first military unit to enter Tokyo, Japan, to get the occupation under way.

Although the First Cavalry Division has only been organized as a division since 1921, many of its units date as far back as 1855.

On March 3, 1855, Congress authorized the formation of the Fifth Cavalry Regiment. The Seventh Cavalry was formed at Fort Riley, Kansas, in 1866, under Lieutenant Colonel George Armstrong Custer. The Eighth Cavalry also organized in 1866 lost no time in establishing itself as one of the outstanding regiments in the American Army. The Indian Wars were over when the First Cavalry Division's youngest regiment, the Twelfth, was formed on February 2, 1901.

But it was an entirely different First Cavalry Division of 1921, the year the division was organized, from the regiments of the olden days. To be sure the morale and élan of the old cavalry troopers who fought the Indians was passed down through the generations to the soldiers who fought the Japs. But the tactics and armament had changed.

Gone were the covered escort wagons. In their places were huge, modern cargo trucks. The well-groomed horses were gone from the division when it embarked for overseas in 1943. Instead of blacksmiths paring hooves, motor mechanics cleaned and tested vehicles. Gone were the Gatling guns with their rotary guns of bygone days. In their place were .30 caliber machine guns. Gone were the old single-action rifles. Instead there were trim repeating carbines, Tommyguns and Browning automatic rifles.

Even though the division had trained for years with horses as its means of transportation it was still capable of becoming successful infantrymen overnight. In early 1943, the division was still mounted. By early 1944, the division had, as a dismounted unit, invaded and defeated the tough Japs on the Admiralty Islands.

The First Cavalry Division was successful as a dismounted unit; however, many of its leaders felt that it would have been even more successful as a horse-mounted unit. It was realized by First Cavalrymen that horses were a means of transportation rather than attack. Horses were capable of going where vehicles couldn't pass. Especially in mountain and wooded terrain a horse-mounted unit could have been used to an advantage.

A modern, well-equipped cavalry division, be it dismounted or mounted on vehicles or horses, is a highly desirable unit in any army. The First Cavalry Division proved this in three major Pacific campaigns. Its now famous "flying column" established the fact that a mechanized and motor-mounted cavalry unit can be successful. The "flying column" crashed through 100 miles of enemy territory in 66 hours to capture Santo Tomas University Internment Camp in Manila and liberate allied civilian internees.

When the First Cavalry Division was alerted for overseas and combat, horses and horse equipment were hastily turned over to other units. By June 18, 1943, the last unit of the division had left Fort Bliss, Texas, which had been the division's headquarters for 22 years.

Arriving in Australia in July, 1943, the division underwent special jungle and amphibious training for five months. After Australia they had a short stay in New Guinea.

Then, the Admiralties, the division's first combat action in World War II. A reconnaissance force under the command of Brigadier General William C. Chase, present division commander, hit the beach of Los Negros on the morning of February 29, 1944, with the mission of securing and holding Momote Air Strip.

A tough assignment had been handed the Cavalrymen in their first test of battle, but they had undergone months of strenuous training and were ready for it.

For the first 24 hours it was 1,000 First Cavalrymen against 5,000 combat veteran Japs. The battle was on.

Six hours after the original landing, General Douglas MacArthur came ashore to discuss the situation with General Chase. The Commander in Chief told him, "You have all performed marvelously. Hold what you have taken, no matter against what odds. You have your teeth in him now—don't let go." General MacArthur then turned and decorated Lieutenant Marvin J. Henshaw, first soldier ashore, with the Distinguished Service Cross.

The original reconnaissance force to land on the

Admiralties consisted of the Second Squadron of the Fifth Cavalry Regiment, a section from the 99th Field Artillery Battalion, a platoon from Troop A of the Eighth Engineer Squadron and attached units.

Four thousand five hundred Japanese soldiers were killed in this campaign.

Many feats of heroism were performed by American Cavalrymen in this Pacific action. One of the greatest acts of outstanding personal bravery was performed by Sergeant Troy A. McGill, Troop G, Fifth Cavalry, who was awarded the Congressional Medal of Honor posthumously. He fired his weapons until all his ammunition was gone and then singlehandedly charged the Japs with a gun using it as a club until he was overcome and killed. He was credited with killing more than 60 enemy.

Major General Innis P. Swift was in command of the First Cavalry Division during the Admiralties campaign. General Chase commanded the First Brigade while Brigadier General Verne D. Mudge commanded the Second Brigade.

Following the fierce fighting in the Admiralties the First Cavalry Division troopers settled down to a few months rest. Then came an assignment that was to turn out to be even bigger and tougher than the Admiralties. The First Cavalry Division had been selected as one of the four initial divisions to storm the beaches of Leyte Island in the Philippines.

At 10 A.M. on the morning of October 20, 1944, the first wave of Cavalry troopers hit the beach at Leyte.

The Seventh Cavalry Regiment under the command of Colonel Walter E. Finnegan started off the Philippines campaign by taking Tacloban, capital of Leyte Province, a full day ahead of schedule.

They continued to push on until they were approximately four days ahead of the original schedule when they captured the town of Babatngon after moving across the entire northwestern end of the island. In making this rapid movement the First Cavalry Division's assigned mission of securing San Juanico Straits also was accomplished ahead of time.

Two other regiments, the Fifth and Twelfth Cavalry, spent more than 50 days in the rugged, mud-soaked mountains of Western Leyte, which was the Japs' last stronghold. The Twelfth Cavalry was the unit that fought through to deliver the final blows to the stubborn Jap forces on Leyte.

During these actions the Fifth Cavalry was commanded by Lieutenant Colonel Charles E. Brady, the Twelfth by Colonel John H. Stadler, Jr.

The division came in as a reserve unit after the island of Luzon had been invaded on January 9, 1945. It landed on the Luzon beaches January 27, 1945. Three days later it was scheduled to begin a maneuver that would overshadow everything it had done in the past.

One minute after midnight on February 1, 1945, the division started its dash for Manila, capital city of the Philippines, to liberate 3,700 civilian allies interned at Santo Tomas University and also to capture and secure Malacañan Palace, capitol building of the Philippines.

When the First Cavalry Division left Guimba, where the push to Manila began, the column was spearheaded by tanks from the 44th Tank Battalion and squadrons from both the Fifth and Eighth Cavalry Regiments. The force was under the command of General Chase.

Supporting the leading column was the remainder of the Fifth and Eighth Cavalry, and the other two Cavalry regiments in the division—the Seventh and Twelfth.

Twenty miles from Manila at the Angat river the First Cavalry and the 37th Infantry Divisions made contact. They had been operating parallel to each other. Until the divisions reached Manila the 37th Division had been meeting the most enemy opposition.

A few minutes after 6 P.M., February 3, a Cavalry tank entered the city limits of Manila. The First Cavalry Division had added another "first" to its credit.

On the outskirts of the city the Cavalry column split. One unit sped on to capture and occupy the Malacañan Palace—the other rushed through Manila's streets, crashed through thick walls to capture Santo Tomas University and liberate more than 3,700 allied civilians who had been interned by the Japs for three years and a month.

This event was to climax everything the First Cavalry Division had done in the past. Today it is still the highlight in the division's outstanding history.

During the Leyte campaign and the Luzon campaign until February 28, when he was wounded by a Jap grenade, Major General Verne D. Mudge commanded the First Cavalry Division. Brigadier General Hugh F. T. Hoffman replaced General Mudge and commanded the division until August of 1945. At that time General Chase, by then a major general, returned to the division from the 38th Infantry Division, which he had been commanding for several months, to assume command. General Chase is today commanding the First Cavalry Division in Japan.

No division in the American Army today can boast of a prouder record than that of the First Cavalry Division.

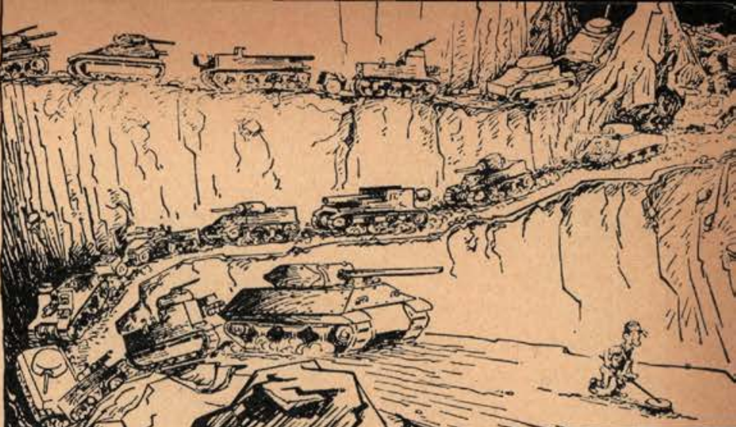
Yes, the horses are gone from the division, but the traditions are still there as they have always been. The First Cavalry Division has established a lasting place for all Cavalrymen in American military history.

Today "First" still means "Number One" to every member of the First Cavalry Division.

* * * *

What's Wrong With Armor?

CARDED



"Mechanized War" by Sergeant George Baker. Reprinted with permission of *Yank* Magazine from the November 3, 1944, issue.

*by Captain Stephen M. Barker**

Holder of the DSC, Captain Barker served a great deal of his time with armored units in combat in World War II. Herein the author shows the necessity for an armored force with its own mechanical mine sweepers and bridges. His suggestions are timely and worthy of consideration.

TAKE a look at the miles of "tanks" crawling slowly forward while "Sad Sack" clears the way. We smile now, but incidents like that were once routine. Can't you hear an angry general . . . roaring for action . . . and a bristling colonel blaming the engineers? The engineer commander rushes to the defense of his "Sad Sacks," but still the column creeps slowly on.

Smile now while you can. Then look at the picture again. Doesn't the artist hit the nail on the head? There is mechanized might, hell on tracks, or whatever you wish to call our fastest moving, hardest hitting ground force. A half dozen mines, a crater in the road and a handful of snipers can easily delay a large armored force. It has happened uncounted times. TNT to stop the tanks . . . snipers or mortars to stop "Sad Sack" with his gadgets and tools . . . and our most mobile arm is the least mobile of them all.

A paradox? Yes. Armor is designed to crush the enemy with exceptionally mobile, hard-hitting weapons, its personnel protected with armor plate. The defense against it is logical. Stop the tanks with obstacles that force dismounted men and vulnerable equipment to prepare a new crossing or route. Now stop the unprotected men and machines with mortars or other weapons which are poor targets for the tanks. The weak link is the dismounted men, the engineers. Our armor depends upon relatively unarmored engineers.

In spite of all this they have done a stupendous job by previous standards. That they could do one hundred times better with special equipment is seldom considered. We must consider it, now more than ever, for other nations have watched us. They may have learned lessons from our experience that we have failed to grasp.

The basic principle of armor . . . high mobility combined with heavy fire power and relative invulnerability . . . has barely been tested, for armor has been mobile only in the most favorable circumstances. Modern armor relies upon terrain free from artificial and natural barriers or else upon a previous penetration of the enemy defense to a depth that provides intact bridges and unmined country.

Armor, to be fully exploited, should be able to advance as fast as it can overcome the enemy. Enemy strength in men and weapons should be the criterion. Inert obstacles such as mines and streams should not be. Powerful as armor is, it can never deliver its Sunday Punch until it can roll over obstacles.

It is true, we have excellent obstacle crossing equipment . . . by the old standards. The bulldozer, the treadway bridge, the bailey bridge and others are now recognized essentials in an armored offensive. They nevertheless are insufficient. They are too slow to permit the proper use of armor. An enemy sniper or mortar crew can stop a bulldozer or a bridge building job. Work jobs must have outposts or some semblance of a bridgehead. Bridgeheads take time. This is the fallacy, the paradox of armor, the missing equation in the theory of tanks.

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*Former 1st Armored Division Engineer Officer.

Armor will be delayed as long as we adhere to the ancient bridgehead theory. It will be delayed at each demolition as long as it takes, first, to establish the outposts or bridgeheads, second, to overcome the obstacle, third, to get the tanks over the new crossing and once again into contact with the enemy. And, each delay permits the enemy time to prepare a new obstacle.

These delays during obstacle crossing are in direct opposition to the theory of tanks. Armor should be insensitive to small-arms fire. The fault lies in our so-called armored engineers, our dismounted mine detectors. Dump truck and dismounted engineers have no place at the head of an armored column. Yet we depend upon them.

Yes, the trouble with armor is its unarmored engineers. Rather, it is with our concept of the armored engineer's role. Insufficient stress has been laid upon speed. Armor must *smash* its obstacles, or hurdle them without pause. A dump truck engineer organization is not capable of the required high-speed mission. Armor should rely upon special engineer equipment to gain the necessary speed. The special equipment must be at least as invulnerable to enemy fire as the tanks themselves. We must therefore consider armored engineer methods, organization, and equipment in an entirely new light, for upon these depend the future of the tank, the blitzkrieg and maybe even greater issues.

THE DOGGONE GADGETS

Important beginnings have already been made with special obstacle reducing equipment. I vividly recall the astonishment and interest of a truckload of high-ranking German prisoners on one of those glorious last days of the war. They saw in our column of monstrous bridge-carrying tanks of the "ark" type and in our many other "gadgets" things which many of us have failed to appreciate. Again, I have seen the surprise in an enemy doughfoot's eyes as he looked at an American tank dozer and slowly realized its purpose. Even more awed were the Germans guarding Anzio's mine fields when they saw a "snake" explode a clear lane before their eyes releasing the trapped armor from the countless thousands of enemy and allied mines.

Yes, steps have been taken to replace "Sad Sack" and his mine detector. Many were field expedients demanded by the situation. For, war with the Wehrmacht, which developed mining and demolition to a fine degree, has proven their need and started their development.

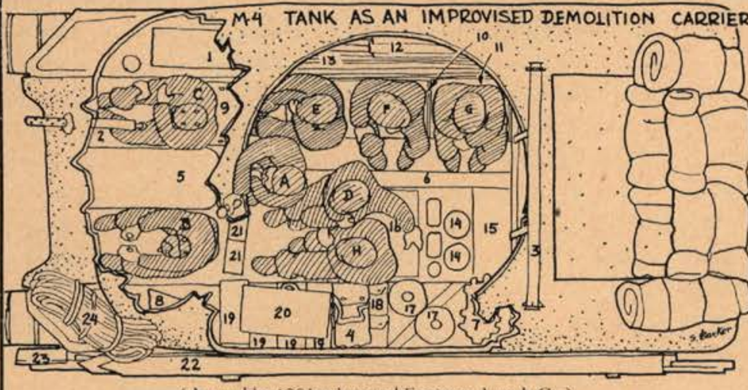
For instance, the British at Alamein, faced with hundreds of thousands of mines, improvised two flails or "scorpions." Chains fastened to a rotor on the front of a tank and powered with a Ford engine lashed the ground to detonate mines. The machines were new and makeshift. It is not surprising, therefore, that one wore itself out in the main attack, even before it reached the mine field. It was, nevertheless, a step in the right direction, and the British Eighth Army at once made a large number of better "scorpions." Soon an improved model was produced in the United States. Then, in 1943 in the American Fifth Army, a provisional mine clearance company was organized and equipped with "scorpions." Later, an improved flail, the British "crab," was manufactured and put in combat, but even that had minor faults that made it impractical. At least it could cross the bailey and treadway bridges, which the "scorpions" could not due to their bulky, sideheavy, outboard auxiliary engines.

The tank dozer is another example of an armored obstacle remover. In a muddy Italian field in 1943 engineer officers and ordnance men of the U. S. First Armored Division mounted a D-7 angledozer blade on a T-2 tank retriever and controlled it with a Quickway crane winch. This tank dozer proved better than a previous model, and although it was far from perfect, it possibly contributed as much as any other single factor to the saving of Anzio beachhead during the four long months of siege for this vehicle extinguished from one to a dozen major fires nightly in ammunition dumps by covering exploding ammunition with soil while the dumps were being strafed, shelled and bombed in an enemy effort to destroy our fire power. This is not a typical case of armored engineering, but it shows what tank-mounted machinery can do in the face of furious enemy opposition.

A still better tank dozer, made from an M-4 medium tank, a D-8 dozer blade, and a bridge truck hydraulic system, ignored shelling and small-arms fire to fill craters and gorges in the mountains of Italy which is poor tank country at best. It was "knocked out" on many occasions like many a good tank has been, but it nevertheless remained in almost daily combat. On one occasion this vehicle and another tank dozer spent three days during active combat working two miles ahead of all other troops to prepare a ford and several by-passes. That is an almost absurd example of true armored engineering.

The widely distributed "GI tank dozer" has proven many advantages of armored obstacle reduction. Yet, it was relatively undeveloped and in most cases poorly exploited. Its maintenance problems were so great that three tank dozers were required so that one might be in operative condition when needed. Bogies, clutches and engines wore out at a terrific rate, yet these dozers did many "impossible" jobs.

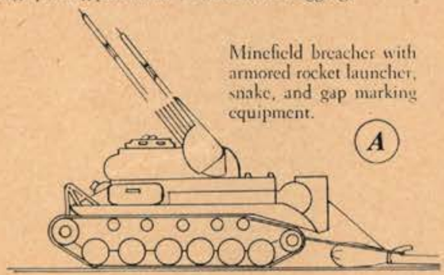
Its greatest fault was usually its crew, as is often the case with special equipment. Just as the blade had been hung on the tank, as an afterthought, so had tank dozers been distributed and manned . . . as after-



(As used by 6201st Armored Engineer Assault Co.)

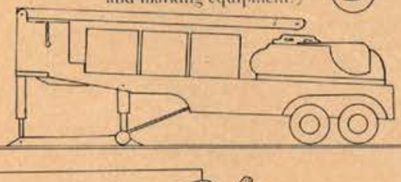
PERSONNEL. (A) Commander, squad leader; (B) Driver; (C) Ass't driver, gunner, ass't radio tender; (D) Ass't squad leader, demolition expert, (E) Radio tender, demolition expert; (F) Demolition expert, Bazooka man, mine detector operator; (G) Demolition expert, Bazooka man, mine detector operator, and (H) Demolition expert, rigger

EQUIPMENT (1) radio, (2) light machine gun; (3) bazooka; (4) bazooka ammunition, (5) tank transmission; (6) tank drive shaft, (7) tank generator; (8) tank dash board; (9) escape hatch, (10) chest, demolition equipment, (11) crate, smoke pots; (12) snake explosive, 12 charges, (13) bangalore explosive, 40 sections, (14) M-2 shaped charges, 8, (15) extra space for extra equipment; (16) General Wade shaped charges, 4; (17) T-3 shaped charges, 3; (18) chain block explosive, 4 carrying bags, (19) C-2 plastic explosive, 4 50-lb. cases, (20) mine detector, (21) C rations, 2 cases; (22) tubes for driving boreholes in banks & walls with tank, (23) charge placing poles, and (24) tackle for rigging.



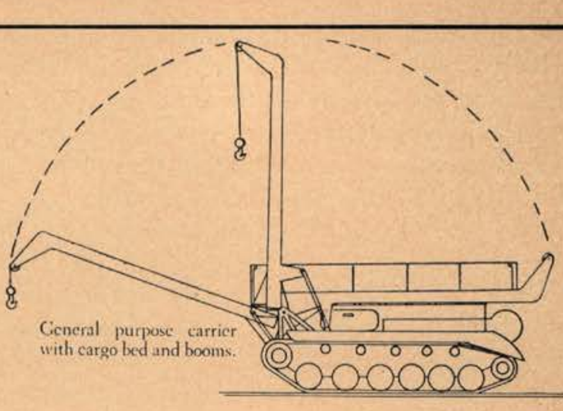
Minefield breacher with armored rocket launcher, snake, and gap marking equipment.

A

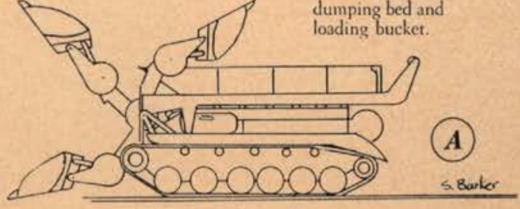


Trailer with minefield breacher. (Armored rocket turret with gapping and marking equipment.)

B

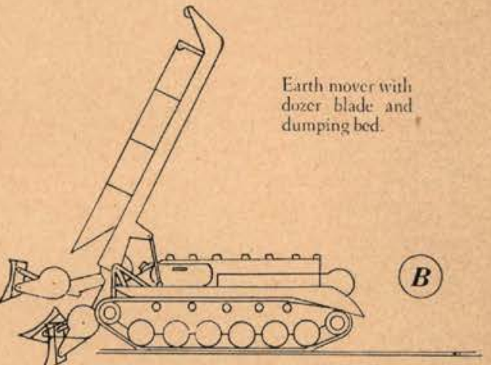


General purpose carrier with cargo bed and booms.



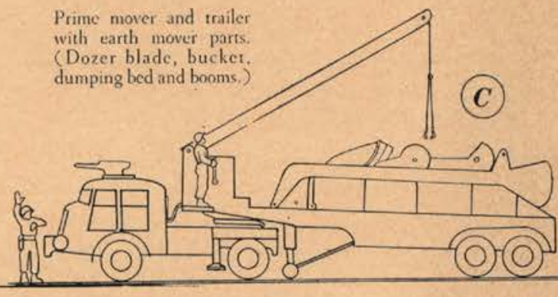
Earth mover with dumping bed and loading bucket.

A



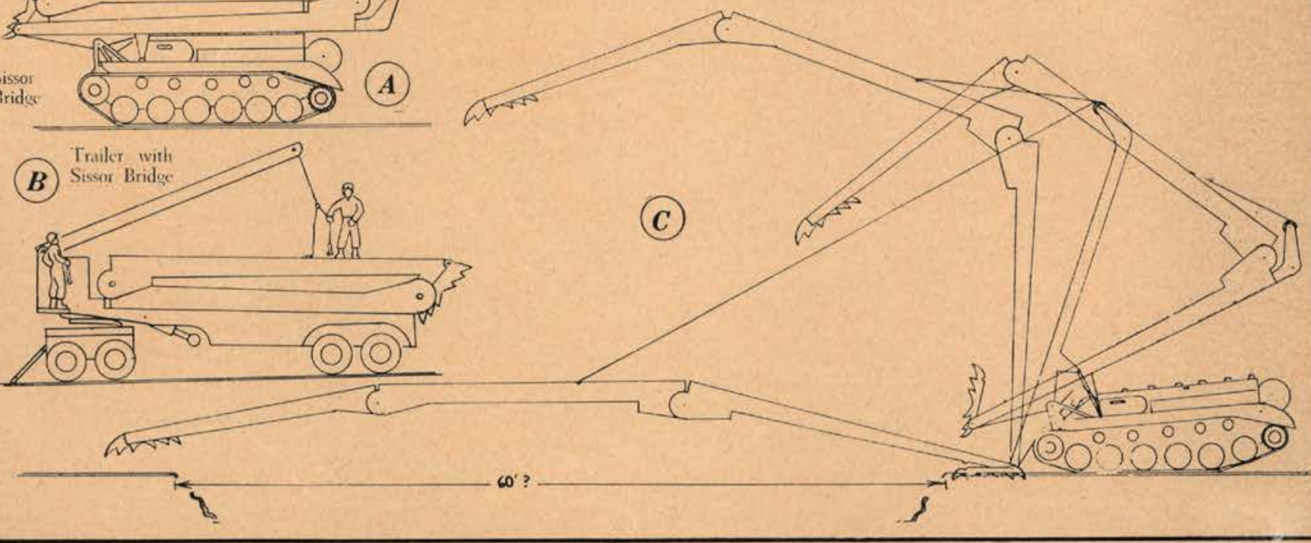
Earth mover with dozer blade and dumping bed.

B



Prime mover and trailer with earth mover parts. (Dozer blade, bucket, dumping bed and booms.)

C



Sissor Bridge

A

Trailer with Sissor Bridge

B

C

thoughts. Provision for manning and maintaining such special equipment must be reflected in tables of organization or amendments thereto.

Other "working tanks" that have already been produced or improvised are rollers of various types for detonating mines, folding bridges such as the British scissors, the Churchill Self-launching Bridge, the LVT "doodlebug" ramp for mounting coral banks, ark bridges, fascine carriers for filling ditches, demolition carriers and personnel carriers. Tank retrievers belong in the same class for they have proven themselves vehicles capable of removing obstacles and even carrying and placing bridges under fire. Likewise, such accessories and means used by tanks as "snakes" and rocket trailers for detonating mines, mortar grapnels for pulling trip wires, direct armor-piercing cannon fire for producing bangalore-boreholes, petards and demolition rockets for breaching walls, the Davis treadway dolly bridge, the various tank launched bailey bridges, the tank pallet or sled for hauling assault supplies . . . these, and numerous other armored and semi-armored obstacle reducers have been improvised and used in battle. Necessity has mothered their invention. One can plainly see the direction in which the armored units have been groping.

The next logical step was to design a special machine plus a special organization with a special mission. This was far more difficult.

ARMOR'S UNARMORED ENGINEERS

One of the most notable "working tanks" was the British Avre (armored vehicle, royal engineers). This Churchill tank, stripped of its gun, was equipped to carry engineer troops, tools and explosives. It mounted a petard or spigot-type mortar capable of throwing a 40-pound demolition bomb. The crew was a special engineer squad with a very particular mission.

The American version or AVE (armored vehicle engineer) was an M-4 tank with tank dozer blade, room for engineer soldiers, explosives, and a rack of demolition rockets atop the turret in lieu of cannon or petard. It was a noteworthy vehicle in many ways. Even so it had its faults, for it possessed the mechanical failures of the tank dozer. Theoretically it was sound, but in action neither it nor any other tank formed the basic item of equipment around which the standard U. S. armored engineer battalion was designed. If anything held that unique position it was the two and a half ton GMC dump truck.

Useful as the dump truck was, it still depended upon hand loading, for no quick mechanical means was furnished the armored engineer battalion normally. Once loaded with gravel it provided the squad it carried with no room for their tools, their explosives, or themselves. The men had to stand atop the load, or as I have seen them do, attempt to dig foxholes in it. Miserable vehicles they were to accompany the point of a column, yet it is the point that needs the immediate engineer support to get ahead. The only other alternative for the assault engineers was to ride the top of a fighting tank, carrying only those tools and explosives that they could hold in their hands. Naturally their support was feeble and slow, for they could do little more than call back for bridging or whatever else was needed and ask for the establishment of outposts or security that the bridge or by-pass might be completed. Thus, in crisis after crisis, armor was relying upon unarmored and unequipped troops.

Consequently, just prior to the 1945 Po Valley Offensive, the First Armored Division did considerable experimentation in armored assault of such obstacles it expected to encounter as fortified ditches, dykes, canals, etc. The entire division was trained in special techniques and a provisional company of 260 men and 44 special purpose tanks was formed. Included were arks (tanks with bridging welded on top), fascine carriers (tanks adapted to place log and culvert crossings in deep but narrow streams), personnel and demolition carriers (modified tanks affording maximum dismounted support for the head of a column), tank retrievers (for removing obstacles, placing bridges and withdrawing arks, etc.), crabs (for clearing mines), dolly treadway bridges (short wheeled bridges pushed by tanks), tank dozers and a Churchill self-launching bridge tank.

Actually the equipment was used in very few instances, for the enemy ran short of explosives and abandoned demolition almost entirely. Nevertheless, it proved its ability to do speedy construction while under fire. Furthermore, the bulky equipment had a grueling test of its ability to march. The organization likewise was tested in its capacity to function administratively and otherwise during a campaign. Many important lessons were obvious to those who heeded them. One lesson was that that particular type of unit is not the best answer to the assault clearance of obstacles even though it does have many advantages over conventional engineer methods and equipment.

Most obvious was the fact that new ways of getting our armor forward in spite of natural and enemy obstacles are quite possible. There is no doubt that with new techniques of obstacle assault armor can fulfill the smashing mission expected of it, but without engineer support that is truly armored our tanks will often be the least mobile of all our fighting forces.

ARMOR NEEDS A "WORKING TANK"

Let us now consider the problem from its logical beginning. First we must ask, "What are the fundamental requirements of obstacle assault equipment?" A likely answer is that such machinery must possess speed, relative invulnerability, mobility, dependability and versatility. These at least are the most obvious requirements.

We can gain speed in overcoming obstacles, first, by replacing manpower methods with modern mechanical means such as a contractor employs whenever possible. Second, we must provide both crews and machines with armor, thus decreasing the necessity for establishing the small but time-consuming bridgeheads around them. In other words, the machines must be just as invulnerable as the tanks, if not more so. Third, and this is important, the required men and machines must be available in sufficient quantity to handle all of the work expected, and handle it simultaneously at numerous places.

The assault vehicles must obviously be mobile. They must go wherever tanks go. Most of today's "gadgets" cannot. Assault vehicles must therefore closely approximate fighting tanks in height, width, length, weight, turning radius, fording ability, flotation, etc. It is a sad mistake to try to increase the mobility of armor with vehicles that are more clumsy than armor, yet that has often been attempted.

Dependability is of vital importance. Skeptics point to the continual bogie trouble of the tank dozer as their chief argument against it. An armored dozer designed specifically for its job and thoroughly tested should be just as dependable as an ordinary tractor type bulldozer or an ordinary fighting tank.

Versatility is probably the most important requirement of all. Terrain and natural obstacles change from one mile to the next. Furthermore, a clever enemy can make obstacles in a multitude of forms. The methods and equipment for overcoming such obstacles must therefore be extremely adaptable. A minimum number of types of unusually versatile equipment must be developed. These machines, moreover, must be incorporated in the TOs and TEs of the armored engineers in such a way that their numbers can be varied . . . some types dropped . . . others added . . . according to the particular campaign requirements. Provisions for modifying maintenance facilities and crews accordingly are also necessary.

Allowance for experimentation and modification of methods and machinery in the field, close to the front, is also a necessity if rapid adaptability is to be gained. Experimentation in the field by U. S. Army units in the recent war was done under considerable handicap. Here necessity not only fosters invention but demands practical results. It is here, therefore, that research and development should be carefully encouraged as a useful adjunct to the experimental programs carried on at the forts and factories within the U. S.

THE VERSATILE VEHICLE

It is quite possible that a single heavy duty tanklike chassis equipped with certain standard accessories can replace all, or almost all, of the many types of gadgets needed. This chassis should be armored but not armed heavily. Its sole purpose is to do a job of work, not to fight. Fighting is the task of the fighting tank. This vehicle should have a power take-off, a hydraulic pump and a fast but powerful winch, all for operating the various accessory parts. The chassis should have cargo space, plenty of it. It is needed for carrying explosive equipment, construction tools, building materials, or men, as the case requires.

The addition of various accessories would convert the chassis to any one of several types of assault machine. These essential types of assault machinery are: 1. earth-movers, 2. mine-removers, 3. bridges, 4. carriers. Let me explain them.

By an "earth-mover" I mean something along the lines of one or more of the following pieces of equipment: bulldozers, scrapers, carryalls, loaders, dump trucks, demolition rockets, petards, and bulk explosives. All are used to move dirt, or other obstacles. The answer may be a tank chassis with a dozer or loader type blade and a dumping truck type bed. A flail, snake, or rocket launching attachment may solve the problem of the mine remover. The bridge should probably be a scissors type class 40 span of 60 feet or so although the tank should also be able to launch, by pushing, a standard military bridge like the bailey of 100 feet or more.

By "carrier" I mean a truck-like vehicle. It should be part of the "earth-mover" just mentioned. It should also be easily adapted for carrying ponton type bridging, storm and assault boats, bulk explosives, mines, culverts, fascines, prefabricated road mat and all the other paraphernalia of the engineer's trade. Like the present Brockway bridge truck, it should have booms or a derrick to place its load accurately as well as to load itself. The bed should dump, not rearward like a truck, but forward over the tank's bow. As a carrier it should also be able to transport an armored heavy duty air compressor for inflating pontons and powering hand tools.

The army's truck-mounted Quickway Crane towed a special accessories trailer with pile driver, crane boom, bucket and shovel attachments mounted upon it. In a similar fashion, the proposed vehicle should have its accessory parts easily transportable on special trucks or trailers. These accessories should be mounted on wheels in the division rear until needed. Spares should be in Corps and Army dumps likewise on wheels and ready to roll. When needed they would have to travel forward, meet the tank chassis near the front, and without the aid of other equipment these two should exchange loads in a matter of minutes.

Of course the division's obstacle removers would all be equipped with one accessory or another according to the needs of the battle. They would travel with the division's points ready for instant work. But, when one equipped as a bridge layer for instance, expends its load, it must be quickly fitted with a replacement bridge. It must travel but a very short way to the rear to obtain this replacement bridge. We must therefore carry extra loads and accessories. We must keep these loaded "on wheels" ready for instant marching. They must be ready to roll at all times.

These accessories should not overtax the trains and dumps. I do not propose, for instance, that a normal quota of bridge be carried in a desert campaign. Nevertheless, the replacement loads must be available in quantity, for they are the ammunition of the working tank.

The Avre was World War II's nearest approach to the all-round working tank. It was considered adaptable to every assault need. If it was, it was at least too time consuming to adapt it in combat. Its turret had to be removed and the tank had to be rebuilt with a special cupola before converting it to a self-launching bridge. It was an excellent vehicle, but armor's engineers need more than a made-over tank. They need a new and special piece of equipment.

The answer is a better vehicle than the Avre, the bulldozer or any present machine. Its construction is far from impossible, for we need only to consolidate upon one chassis various types of existing equipment. This is well within the scope of American industrial knowledge and American military ability.

The "gadgets" have proven that special armored vehicles can quickly and effectively fill craters, place bridges, clear mines, etc. In the future they will replace the dump truck engineers. Of course it would be foolish to attempt to replace skilled, courageous hand labor completely, but we must not depend upon it as we have, nor should we carry it exposed and without adequate equipment on the top of a fighting tank.

Let us look ahead. A war in the future may use innumerable nasty devices. Blown bridges may be contaminated with persistent chemicals, virus or bacteria, mines with proximity fuses and radioactive debris. These would seriously delay most manual labor. Airtight tanks protected from radioactive soil with special armor may be essential for fighting, for carrying troops and even supplies, and most certainly for clearing obstacles and bridging streams.

Yes, the "Rube Goldbergs" are here to stay. Careful thought must be given their development, for armor's wallop depends upon them.

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ACTIVATED ORC CAVALRY AND TANK UNITS

Here are the names and location of the Cavalry and Tank units that have been activated to date in the Organized Reserve Corps:

FIRST ARMY AREA

Boston, Mass.—Headquarters and Headquarters Troop, 304th Cavalry Group.
New York, N. Y.—Headquarters and Headquarters Troop, 303d Cavalry Group.
Brooklyn, N. Y.—Headquarters and Headquarters Troop, 302d Cavalry Group.

SECOND ARMY AREA

Washington, D. C.—782d Tank Battalion (Armored-Drawn Type).
Cleveland, Ohio—83d Reconnaissance Troop.

THIRD ARMY AREA

Atlanta, Ga.—Headquarters and Headquarters Troop, 301st Cavalry Group.
Athens, Ga.—314th Cavalry Reconnaissance Squadron.

FOURTH ARMY AREA

None to date

FIFTH ARMY AREA

St. Paul, Minn.—315th Mechanized Cavalry Reconnaissance Squadron.

SIXTH ARMY AREA

Phoenix, Ariz.—Headquarters and Headquarters Company, 19th Armored Division.
Seattle, Wash.—75th Amphibious Tank Battalion.

CARDED

The Capture of Muhlhausen★

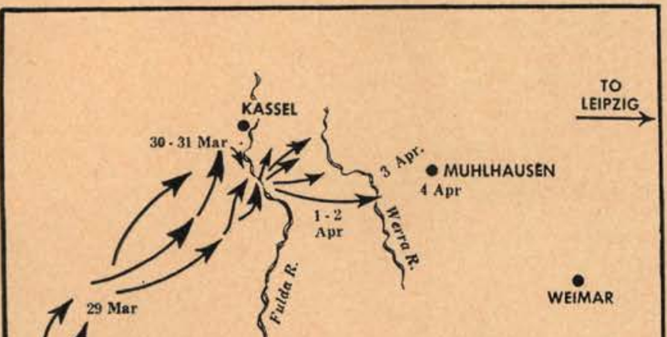
by Brigadier General R. W. Grow, United States Army

THE operation described here was typical of many during the great exploitation east of the Rhine in March-April 1945. There are several important tactical principles involved and the action was so successful that it warrants study.

BACKGROUND

After crossing the Main River from south to north, a few miles east of Frankfurt late on 28 March, the 6th Armored Division came under XX Corps and was given the mission: "Seize Kassel," (about 100 miles air-line). By dark on the second day (30 March) a line some five miles south of Kassel had been reached. Resistance which had been scattered then suddenly stiffened to the extent that a coordinated attack by at least the whole division would be required. In the meantime the 80th Division was closing up, so on corps order the latter took over the mission of capturing Kassel to the north while the 6th Armored turned east initially with an objective of Leipzig (125 miles), changed late on 31 March to Weimar (80 miles a little south of east). To reach either objective the general route lay through Muhlhausen.

As can be seen from Sketch 1, the division operated in multiple columns, four to six (not all of which are shown); but was forced to cross both the Fulda and Werra Rivers in a single column. The reasons for this constitute an interesting study in themselves. It was SOP in the 6th Armored Division to hit any river on as broad a front as possible with four or more columns if routes were available; to seize initially existing crossings, if any, and establish small bridgeheads. Then depending upon how many crossings were secured we poured everything over the most suitable ones. If no bridge was captured one had to be built after the site was seized. There was always the question: Should we build more than one bridge in order to cross faster? The answer depended on whether material was available to build two or more simultaneously, or could we build one and get everything across it before material for a second could be spotted.



Sketch 1.

All bridges over the Fulda south of Kassel had been destroyed except one railroad bridge which was partially gone (one track of the double track was left). The best bridging site appeared to be opposite the 69th Combat Team, which fought its way across dismounted against machine-gun fire on 31 March. A bridge was built that night. The Cavalry Reconnaissance Squadron picked its way precariously across the railroad bridge a few miles to the north, and the balance of the division crossed the engineer bridge on 1 April, immediately developing into six columns on the east bank.

The Werra River presented a slightly different problem. Each column had encountered considerable opposition and enemy air had been particularly active on 1 and 2 April. Of the six columns the one on the extreme right captured a bridge intact. The one on the extreme left had an intact bridge in its front strongly defended. Therefore the three right columns (CCB) were all diverted over the captured bridge at once while the attack on the left (north) bridge defenses continued throughout 3 April. The enemy finally destroyed the bridge before it could be seized so during the night of 3-4 April, the three left columns (CCA) were pulled to the south and again the whole division crossed a single bridge, fanning out on the east bank and continuing on 4 April.

Had we given the enemy more time by advancing on a narrow front, the bridge which we seized would have been blown, as it was prepared except for the placing of explosives which had not arrived.

CAPTURE OF THE CITY

The picture as it appeared to us on the morning of 4 April is shown on Sketch 2.

Muhlhausen was known to be a city of about 50,000 and to contain certain important German government officers and officials. It was probably defended but it was important to prevent the escape of the government officials. German resistance in the Bad Sooden area had been strong and the enemy was known to be in strength in the hills north of Eschwege. There had been no resistance at Gross Burschla, but Wanfried was held by the enemy. There were no friendly troops east of the river to the north of Bad Sooden, and to the

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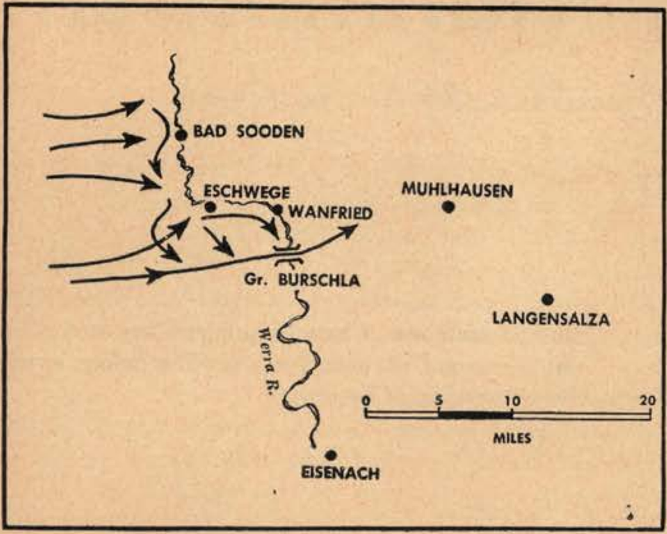
★*Military Review.*



Sketch 2.

south we were out of contact with the 4th Armored Division which we knew was fighting for Eisenach about fifteen miles up the Werra River. Therefore the division was shooting into the open with neither flank covered and the north flank known to be threatened by rather strong forces.

(Parenthetically it is interesting to note that several days later, 7 April, before the First Army troops on the left came up, the division was struck on the left rear by a strong counterattack northwest of Muhlhausen and was forced to throw all reserve troops into action to clear the pocket north of Eschwege and east of Bad Sooden, destroying a force of 1,500 Germans.)

For a few miles east of the Werra River the country is hilly and wooded, then just west of Muhlhausen it breaks into the great Thuringian plain, as fine a maneuver ground as one can imagine.

The plan for 4 April was simple and is shown on Sketch 3.

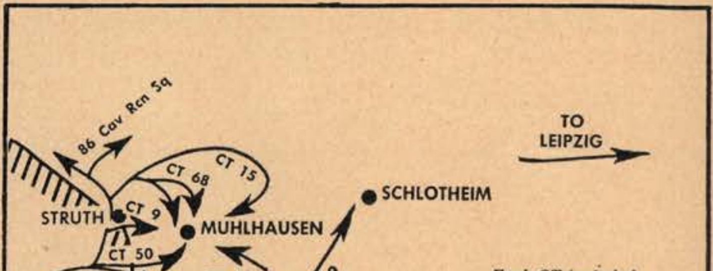
While the 86th Cavalry Reconnaissance Squadron protected the exposed left rear, six combat teams poured out of the hills, deployed across the plain, swiftly knocked out all opposition and completely surrounded the objective. Combat Team 69, in the lead, had no opposition until it neared the airfield northwest of Langensalza. Here tanks laid direct fire at 2,000 yards on German planes frantically trying to take off amid April showers, an amazing sight. (Although the airport was by-passed at this time in order to continue the mission, it was secured the following day together with a number of practically undamaged planes.) The enemy was driven east of Schlothheim and the "back door" closed.

Combat Team 44 had stiff rifle and bazooka resistance in Oberdorla, south of Muhlhausen, and destroyed the town. The other four combat teams each encountered road block and light resistance, but all completed the investment of the city by dark with all exits blocked and patrols working into the suburbs.

At daylight 5 April Combat Teams 9, 50, and 44 quickly entered the city while Combat Teams 68 and 15 blocked and the 86th Cavalry Reconnaissance Squadron stretched east to extend a protective screen along the whole north flank. Prisoners totalled only about 2,000 which accounted for the lack of resistance in the city but some 285 members of the German Foreign Ministry with their records were taken.

Although the resistance actually encountered was not serious, the enemy strength had been unknown and therefore the plan was designed to bring the full power of the division into action against a concentrated objective and at the same time provide ample security against the most dangerous outside threat, from the north (known, 20mm and mortar fire north of Struth) and east (unknown). The problem was not only to capture Muhlhausen but to prevent the escape of important Nazis. Few, if any, escaped. Due to the fact that the division crossed the Werra River in one column, the development had to be successive. Therefore, CT 50 which was leading, initially blocked in the hills southwest and out of sight of the city, CT 69 next in column was given the long mission to Schlothheim, followed by CT 44. Units of CCA crossed the river in the order CT 15, CT 68 and CT 9 so that all closed in on the city simultaneously. The Reconnaissance Squadron crossed ahead of CCA to cover the flank.

After Langensalza was cleared on 5 April, the division established a line from south of that city, north through Schlothheim thence northwest and west which eventually extended forty miles before First Army troops came up on the north flank on 9-10 April.



Each CT included tanks and armored infantry and was directly supported by a 105-mm SP bn.

Sketch 3.

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Planning U. S. Industrial Mobilization

by Leonard J. Grassman

The "Prep Agency" of the United States is the Army-Navy Munitions Board, one of the most important and least publicized mediums of our national readiness against possible future aggression. In this article Leonard J. Grassman gives the first complete picture of just what the ANMB is and what it does.

THE United States must be ready to meet any threat of war. It cannot entrust its security to the conjectures of successful and lasting peace until there is concrete assurance that such a peace is an actuality, not just a possibility. In the meantime, it must remain strong enough to maintain that security. "The price of Liberty is eternal vigilance."

General of the Army Dwight Eisenhower lent the weight of his military genius and leadership to this belief in stating: "National security is a state of organized readiness to meet external aggression by a quick and effective mobilization of public opinion, trained men, proved weapons, and essential industries, integrated into the most efficient instrument of armed defense, and reinforced by the support of every citizen. The security establishment comprises *all* the people, *all* our enterprises, *all* our government."

The government has created an agency to aid in providing us with lasting preparation until we reach that age of peace when such preparedness is no longer necessary.

The "Prep Agency" of the United States is the Army-Navy Munitions Board, one of the most important and least publicized mediums of our national readiness against possible future aggression. It is a board devoted to research in preparation for national emergency and an over-all liaison between our national material might, our industry, and our combat elements.

Although this agency was originally constituted in 1922, it is doubtful that many Americans knew even of its existence—certainly not its functions.

In its 25 years of existence, the ANMB has passed through many periods of change and evolution—from a token body without much significance to its extremely important stature at present. Today, most of its work is concerned with four major responsibilities: the development, during peacetime, of an industrial mobilization plan which will when effectuated develop the national economy and harness industry effectively to the military need in any future emergency: the responsibility for the administration and operation of the statutes covering the stock-piling of strategic and critical materials against the need of a future emergency; the development and expediting of joint procurement between the War and Navy Departments and is assigned policy control of all joint agencies lying between the services wherein they concern themselves with matters of this nature; and is also concerned and responsible for developing and expressing military interest of the services in all matters pertaining to our national import and export.

The Board, at present, is composed of its civilian chairman, Mr. Richard R. Deupree, prominent industrial head, the Under Secretary of War, Mr. Kenneth C. Royall, and the Assistant Secretary of the Navy, Mr. W. John Kenney. The routine of the Board and its operational functions are administered by an Executive Committee consisting of the civilian chairman of

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the Board, assisted by two deputy executive chairmen, one a general officer of the Army Major General Sidney P. Spalding, USA, and one a flag officer of the Navy, Rear Admiral Roger W. Paine, USN. The executive committee is assisted by a staff of about fifty Army and Navy officers and Civil Service employees drawn from the two departments. In policy matters, the Board is advised by a committee made up of the Chief of Staff of the Army, the Chief of the Army Air Forces, the Director of Service, Supply and Procurement of the War Department General Staff, the Chief of Naval Operations, the Deputy Chief of Naval Operations for Air, and the Chief of the Material Division, Office of the Assistant Secretary of the Navy.

Two Special Assistants Brigadier General Edgar P. Sorrensen and Rear Admiral Thomas B. Combs, aid the Executive Committee by reflecting the views of the Army and Navy Air Forces.

Assisting the Executive Committee in carrying out the responsibilities of the Board, supervising and coordinating the work of all subordinate elements to insure close liaison with appropriate agencies of the War and Navy Department and preventing unnecessary delays in the prosecution of the work of the Board is the Secretariat. Comprised of the Army-Navy alternates, Colonel Nathaniel M. Martin, C.E., and Captain G. M. Prevost, U.S.N.R., the Secretariat also insures the plans for the procurement of new items are integrated with the development of such items, maintains close liaison with the agencies responsible for research and development and keeps the Board currently informed on all such matters, along with making special and detailed studies or plans as directed by the Executive Committee or the Board.

One of the foremost of the ANMB projects is the Industrial Mobilization Plan, an instrument of progressive planning designed to evolve with the development of our industrial strength and scientific progress so that in the event of a national emergency, our industrial might and knowledge can be harnessed quickly.

Strong belief that the War Production Board, properly constituted, is to be the inevitable cornerstone of an effective industrial harness in any forthcoming emergency, the ANMB has authorized the creation of a group of distinguished civilians, selected from those with War Production Board experience in the late war, to develop a manual which will embody the organizational changes in the WPB structure considered necessary as the result of actual experience with the one which was developed in the midst of the war. This group will also make recommendations on a complete pattern for the war agencies which they feel will be necessary to be brought into being with the outbreak of war.

Planning of this nature will prevent a repetition of the confusion and frustration experienced by those representatives of industry who hurried to the capital early in the emergency to offer their wares for the defense of our nation only to run into the lack of proper agencies to utilize their efforts or to assign proper priority, etc.

Currently, and since the end of the war, the Army-Navy Munitions Board is aiding in a sensible disposal program for the disposition of war plants acquired by the government during the war, and is also aiding in the retention program—a project to create sufficient "stand-by" plants and other facilities to aid in "to war" conversion and wartime production. It has also completed and will promulgate shortly its pattern of all the inter-agency, service, and civilian industrial advisory committees it considers will be necessary to cover its industrial mobilization responsibilities. The pattern comprises about 75 committees covering the complete industrial field and under them will be created numerous sub-committees to handle specific detail and technical assignments.

Under the Executive Committee are four planning divisions, Materials, Products, Services, and Procurement, from which spring the numerous special committees and sub-committees which encompass all the problems involved.

Materials Division, which collates the military, naval, civilian, and allied requirements of materials, such as steel, copper, aluminum, etc., in an emergency, devises plans for production and supply of such materials, and is responsible for the development of stock piles. It is also concerned with the current study of underground sites, which have proven militarily expedient in modern warfare.

In the recent inspection of representative types of underground sites throughout the nation, conducted by the Corps of Engineers for the Army-Navy Munitions Board, the results of which have not been published, it has become evident to observers that, contrary to common conception, caves do not make the best underground sites for factory or storage use. The natural twists, variations of level, make for a great amount of reconstruction. Another detrimental factor existent in caves is high humidity, which is harmful to stored materials. It appears that mines and quarries are much more easily adaptable to industrial purposes desired in underground utilization. One observer, technically qualified, has noted that soft stone areas, of which there are plenty in the United States, rather than soil, make for better underground sites.

The importance of underground sites in modern warfare need not be amplified. In an atomic war, should the bomb not be outlawed in future warfare, utilization of below-surface facilities is a must. The effects of strategic bombing in Europe and Japan during the war have already proven that even in the use of the lesser weapons, underground factories and facilities are an absolute necessity. The good condition of such facilities in Germany after bombing which obliterated whole cities proves the greater impregnability of Mother Earth and, even now, as our Prep Agency prepares plans for such utilization, it is rumored that another government, using war prisoner labor, has built the biggest underground airfield in the world in a highly dominating and commanding area, which has a great, semi-global, air striking potential. Great Britain's enormous, mile-long, underground factory, which withstood the rigors of the Battle of Britain, is a monument of the strength of below-surface spaces.

In the study of underground sites, one Corps of Engineers colonel put forth a plan substituting American machinery for hand labor in the Japanese "cut-and-cover" techniques for building concrete shelters, miniature hangars, and sub-terrain storage facilities. The Jap technique allows for rapid construction with a maximum use of natural formation and permits concrete construction without forms.

In the stock-piling planning, when the President approved Public Law 520, which authorized $100,000,000 to ANMB to begin stock-piling of materials essential to our national security, it is estimated that around $300,000,000 will be needed for this purpose during the fiscal year. The hundred million dollars was granted during the wind-up of the last session of the 79th Congress under the stock-piling act which contemplates the accrual of scarce but essential items at a cost of around $2,100,000,000, to be spent over a five-year period.

To date, the Board has formalized the stock-pile objectives, year by year, as to composition and requirements, and has determined and directed the purchase of the first year's increment after clearance by State, Commerce and Agriculture Departments and CPA. The Board is developing a supplemental list of items for additional purchase in fiscal 1947 for presentation to Congress for approval, and has also contacted many industrial associations which concern themselves with metals, minerals, and materials, and plans continued consultation with qualified industrial groups in carrying forward its stock-piling programs.

In the initial stock-piling stage, ANMB is concerning itself primarily in drawing from the nation's vast surplus supply of war materials. From this stock are being drawn essential materials necessary to national security, but even in this early stage, the ANMB must keep its eye on our piles of other essential materials, an element which must cause them and the industrialists of the nation great concern because many of these items essential to the stock pile are desired by industry for civilian manufacture. Relative to this dilemma, Mr. Deupree, head of ANMB, stressing that every precaution is being taken not to cripple civilian economy, said nevertheless that an industrial mobilization and stock-piling program is definitely in the making, indicating that certain materials, although critical in civilian production, must be maintained in the stock pile against an emergency.

In stock-piling, the ANMB, by transfer from war surplus and purchase, assembles huge stocks of critical and essential items and materials. Of these, some are lasting and remain a stable stock, some become obsolete and must be replaced, while those with a tendency to become stale, lose strength, or perish are rotated—turned back into market and replaced with fresh and vital material. When purchasing or selling for the pile, the Board conducts its market activities in a quiet manner in order to frustrate attempts to speculate on these activities and also to prevent a physical effect on either the national or world market.

Other national resources, although not assembled in the stock pile, actually are earmarked in "paper consideration" so that, if needed, their source and manner of procurement will be but a simple manner of reference and execution.

The Products Division, which collates the military, naval, civilian and allied requirements for manufactured products in an emergency, devising plans for the production of such products, makes recommendations to the Board concerning the modification or abandonment of existing facilities, the development or construction of new facilities and the allocation of existing industrial capacities in an emergency. One of the causes responsible for the creation of this committee is the entangled problem of producing for more than one service and one nation.

The Procurement Coordination Division supervises and coordinates all phases of procurement by the services wherever joint requirement exists, preventing duplication of effort, eliminating competitive bidding between the War and Navy Departments, insuring equitable distribution of production and further standardizes design, contract procedures and procurement specifications.

In joint-procurement for the services, standardization of items between the services is a major problem, and the standardization of any item or class of items is given careful attention. For example, in a radar set of similar operating characteristics, the Army must have dust protection, while the Navy sets must be of comparatively small size and resistant to gunfire shock. Differences such as these must, if they possibly can, be reconciled.

However, despite the difficulties, a considerable amount of progress has been made. The volume purchase of food and lumber is already integrated, and, in textiles and clothing, footwear and petroleum products, there is close collaboration between the services in the buying operation. The most notable progress is in the field of medical and surgical supplies. The services have not only established a joint buying office in New York, but have succeeded in standardizing about 85 per cent of the items each of them use.

On October 15 of this year, President Truman approved an amendment to the authority of the Army-Navy Munitions Board, the principal effect giving the Chairman of the Board authority to assign to either the War or Navy Department or to a joint agency the procurement of any item purchased for the use of either or both services.

In connection with this approval, the President stated that concentrating in one agency the procurement of each type of common or substantially similar items by the armed services will mean an undoubted savings in money and personnel for the government and will simplify the furnishing of supplies and munitions by industry to the armed services. This authority also includes the power of final decision in the event of disputes between the two departments arising out of the determinations made by the Chairman of the ANMB. Such decisions will be binding on both the War and Navy Departments.

The fourth major division of ANMB, "Services," is charged with formulating plans for the development and control of manpower, transportation, electrical energy and other services required for the mobilization of industry in an emergency; to act as a liaison between the Board and government agencies dealing with finance, price or manpower control, transportation, public relations, or economic warfare, and to supervise and coordinate the preparation of plans for the establishment or activation of such agencies as would be required in an emergency.

"Decentralization of industrial facilities," a much discussed subject by contemporary strategists, either industrial or military, is another subject of interest to the Board.

Modern warfare, which places the whole of the United States within striking distance from many foreign points emphasizes the importance of such decentralization. The Board, in recognizing the importance of decentralization, is making a study of the extent to which Industry is centralized and is doing everything possible to foster dispersal of new and/or future additional plants and facilities to strategically decentralized locations.

Recently the ANMB was given another great responsibility when it was charged with the responsibility for determination of the military interest in national import and export. Because of this, the Board holds membership on inter-agency State Department committees which concern themselves with different phases of economic foreign policy and its members have been active in steps being taken to conserve our national resources.

As evident from the foregoing definition and analysis of the Army-Navy Munitions Board and its activities, the ANMB is a great network of committees whose studies reach into every possible phase of our national structure to bring forth elements for the protection of our national security and to construct the machinery which will make our nation capable of a quick swing to prepared strength in the event of a national emergency. The Board, in acceptance of all these duties, is acutely alive to the great responsibilities it has assumed. It realizes that there must be evolved, in peacetime, practical and well understood mechanisms whereby in a minimum period of time the nation can effectively get into high gear at the beginning of an emergency to produce the requirements of war. These essential mechanisms cannot be evolved or executed with dispatch without the complete cooperation, support and understanding of government, industry, and labor.

The Army-Navy Munitions Board, now, as it goes into full-grown action, is indicative that our nation has reached the end of that indifference of thought and action which has heretofore left our nation inadequately prepared to defend itself. The "Prep Agency," of the United States, with its "gathering" activities, will meet any future emergency just as the squirrel meets the winter—PREPARED.

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GREETINGS 1946

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Strength Report On

Armies of the World

by Major Hal D. Steward

PEAK strength of the Russian Army at the height of World War II was reported to be 20,000,000 persons. Today that is no longer true because Russia, like other Allied armies, has been demobilizing her military forces since the end of the war.

No army in the world today stands anywhere near the top of its wartime strength.

Just prior to V-E Day the United States had 8,300,000 men. Today it has just over a million.

This report on the Armies of the World does not pretend to be completely accurate in its figures. The information included in this article was gathered from numerous sources. Some were highly accurate and others were probably greatly in error. This must be taken into consideration when trying to compile a report on the strength of all the major powers in the world today.

It is widely known that Russia maintains extreme secrecy about the strength of the Russian Army. Any figures on Russian forces can be grossly inaccurate. However, from information available a rough idea of the size of the Russian Army can be given.

Of the five big world powers Russia has the largest army, which is reported to be around 3,000,000 persons. China comes next with about 2,700,000 regulars in the National Army; Britain is third with about 1,500,000 men; United States fourth with 1,100,000 men and France fifth with about 150,000 men.

Both Britain and the United States are following the same policy of trying to build a volunteer army of approximately 1,000,000 men by July 1, 1947. China, of course, is maintaining an army of large strength because of internal trouble. France is still in the process of reorganizing her army, and Russia is reported to be increasing her military strength, but so far that is hearsay.

Military training begins in Russia at the age of 12 when elementary courses are given for two hours each week. Compulsory training begins at 16 and continues to 50.

Estimated population of Russia including the Baltic Republics, occupied Poland and lands returned by Rumania to the U.S.S.R. was about 195,000,000 in 1940. Besides Russia Proper, which has a population of approximately 110,000,000 there are 16 Union Republics that go to make up Greater Russia and bring its total population near 200,000,000 persons.

Russia is said to have a potential military strength of some 40,000,000 persons. This means that Russia would muster into service all physically fit male and female persons between the ages of 14 and 50.

No information is available on the Russian Air Force although they were reported to have had 4,000 planes at the beginning of the war. The Russian Navy consists of only three battleships and smaller craft.

France's army, which today is still being reorganized, will have 55,000 men for the United Nations Force, 50,000 for the Army, 80,000 for the Air Force, and 60,000 for the Navy. France has also 1,000 planes all of which were given her by the United States.

China during the war had about 6,000,000 men in service. Today she has nearly half that number still under arms. Communist China is reported to have nearly a million men in service. It is hard, however, to obtain any accurate figures on Chinese forces as each Warlord has his own army of undetermined size.

One of the large armies of today is maintained by Yugoslavia, who is reported to have nearly 800,000 persons in her army, of which 10 per cent are women. This army is an outgrowth of the guerrilla army that was organized during the war. The Air Force is in the process of being rebuilt. The Navy was completely destroyed in the war.

Spain has been out of the military limelight since the Spanish Civil War, but today she has an army of 10 Corps numbering about 300,000 men.

Brazil, only South American country to send a large expeditionary force overseas to fight in World War II on the side of the Allies, had about 1,000,000 men under arms during the war. Brazil subjects all males between 18 and 45 to military duty under a selective service system. Permanent peacetime strength of the Brazilian Army is reported to be around 100,000 men.

Service in the Argentina Army is compulsory from 20 to 45 years of age. The men belong to the First Line Army for the first 10 years, then pass to the National Guard for 10 years and close their service with five years in the Territorial Guard, mobilized only in the event of war. Argentina maintains a peacetime trained reserve of 300,000 men.

Regular Army strength of Argentina is supposed to be around 45,000 men; however, it is reported that she had nearly half a million men in active service during World War II.

Here is the reported strength of all the American countries: Argentina, 45,000; Brazil, 100,000; Chile, 40,000; Colombia, 10,000; Costa Rica, 500; Cuba, 15,000; Dominican Republic, 4,000; Ecuador, 6,000; Guatemala, 6,000; Haiti, 5,000; Honduras, 2,500; Mexico, 50,000; Nicaragua, 3,500; Panama, no information; Paraguay, 3,000; Peru, 35,000; El Salvador, 3,000; Uruguay, 8,000; Venezuela, 10,000; Bolivia, 15,000.

THE RUSSO-GERMAN

by Captain Ferg

PART

(Editor's Note: *In the September-October issue Captain Fitzgerald surveyed briefly the organization and background of the Red Army, proceeding then to discuss the German campaign against Kiev in the early autumn of 1941, the advance to Stalingrad in the following summer, and the Russian counteroffensive during the winter of 1942-43. He now goes on to outline the major operations on the Eastern Front from 1943 until the summer of 1944.*)

The Battle of Kursk—July, 1943

THE pattern of the Russo-German war during the first three years had a seasonal appearance. Each summer the Germans advanced, each winter the Soviet armies took the initiative. After the Russian winter offensive of 1942-43 the German front was straightened and considerably shortened, and in March a German attack recaptured Kharkov. By early summer the Red Army held a salient between the Valdai Hills and Bielgorod. Orel and Kharkov, north and south of the salient, were still in German hands. Kursk and the territory to a distance of fifty miles west of it was Russian.

In 1941 and 1942 German strategy had been directed towards the total defeat of the Soviet Army. The Wehrmacht's offensive of 1943 was more modest, initially aiming only at the elimination of the Kursk salient. The immense losses in men and material which the Germans had suffered in the Stalingrad campaign in the previous year compelled the High Command to modify its ambitions.

The terrain of the Kursk salient was elevated but not close. A number of rivers have their headwaters in the hills near Orel and on the plateau north of Kharkov, and the stream beds tend to limit maneuverability to a certain extent. Woods are few.

North of the salient were the Armies of General Popov, at that time building up for the first Russian summer attack, which was to be launched against Orel in July. The Kursk sector was defended by General Rokossovsky, with General Vatutin's forces on the left about Oboyan. General Konev stood on the eastern bank of the Donetz opposite Kharkov (*see map of Kursk area*).

The Germans concentrated picked units north and south of the salient with the intention of driving behind and isolating Kursk. In the north was the Third Panzer Army, comprising four panzer divisions (equipped with some of the new *Tiger** tanks) and six motorized and infantry divisions. In the south another Panzer Army, commanded by Von Hoth, contained seven panzer divisions and six motorized and infantry divisions. Strategic reserves totalling six panzer and seven infantry divisions were held at Orel and Sumi. Thus over 500,000 men and a considerable quantity of heavy material was available to Field Marshal Von Kluge for the 1943 operation. The numbers could not be compared with those employed in the Stalingrad campaign, but the mission was very much more limited in scope than that given to Von Bock in the previous summer.

The offensive opened on both flanks on July 5, 1943. Massed tanks, supported by artillery (much of it on self-propelled mounts) drove through the fortified zones to a depth of ten miles in the first three days of the battle. In the north panzers took Malo Archangelsk after a stiff fight, but the Red troops defended the flanks of the German corridor and prevented the panzers from deploying to left and right of the town. After a pause for reorganization another attempt was made to enlarge the Malo Archangelsk wedge in the direction of Poniri. This was also held. A new assault was opened along the Kromi-Fatezh road, but the Russian network of trenches and fortifications obliged the attackers to abandon the attempt. The Russians held their positions in great depth and did not retire from the flanks of the German wedges. Holding the "haunches" of the penetrations, the Red troops threatened the communications of the German spearheads and thus contained large infantry formations which would otherwise have been available to support the leading elements of the attack. This was the *tactical* application of what the Russians had done *strategically* at Voronezh and Stalingrad. The theory is obvious, but it requires courage and tenacity on the part of the defending troops and good judgment on the part of their leaders to apply it on the battlefield.

On July 11th the direction of the German effort was changed and two fresh panzer divisions (probably drawn from the operational reserve at Orel) advanced eastward through Zmievka against General Popov's left wing. Here the attacking troops met with even less success than previously. During the following three days the battle in the northern sector continued, but signs of German exhaustion soon became apparent. The panzers in particular had suffered heavily in their efforts to open the narrow gaps they had forced through the defenses; about 1,000 tanks and a large number of men were presumably lost in the struggle.

In the south the pivot of the first attack was Bielgorod.

★An Cosantóir, Irish Defense Journal.

*The *Tiger* tank was first used in Tunisia in February, 1943. The early models of this German "Infantry" tank weighed 54 tons and were armed with a long-range 88-mm. gun. The later *Royal Tiger* weighed over 60 tons. See also footnote in Part I of this article, in last issue.

BATTLES — 1941-1945*

us N. Fitzgerald

TWO

Some success was gained along the Bielgorod-Kursk railway line but all movements towards the strongpoint of Oboyan were held. By July 10th both Von Hoth and Vatutin had suffered heavy casualties.

Between July 10th and 15th, Von Hoth's panzers penetrated to the heights near Rzhava where a large-scale tank battle developed. As at Malo Archangelsk the Germans retained their narrow corridor but were unable to enlarge it. Von Hoth now turned his attention to the Kotocha area where he succeeded in making an initial advance but was held on the high ground near Shebekino. By July 21st the Germans realized their defeat—the offensive in the north had ended almost a week earlier—and began to withdraw from the advanced positions at Rzhava and Shebekino.

On July 12th, General Popov launched an attack on the Orel area. In the first three days his Army penetrated thirty miles, but the German panzers which were committed north of Kursk succeeded in disengaging, and, battered though they were, four tank divisions reached the Orel approaches on July 20th in time to cover the city. From that date the advances by Popov's troops were achieved by hard fighting.

Rokossovsky similarly regained the initiative and by July 18th had retaken Malo Archangelsk. Farther south General Vatutin rapidly cleared the German corridors into his position and by July 24th the Kursk salient was firmly re-established. The German summer offensive, which lasted less than three weeks, was followed by a Russian offensive north and south of Kursk. On August 3rd Bielgorod was captured by General Vatutin's columns. On 23rd, Kharkov was taken after a bitter struggle. In the north Popov entered Orel on August 5th. The Soviet armies had the line of the Dnieper River as their objective and by late autumn they had achieved it.

The Russians claimed to have inflicted about 100,000 casualties on the Germans and to have knocked out over 2,000 tanks. Even allowing for Soviet exaggeration, the injury to the German attacking forces in the Kursk operation must have been enormous. At least eight panzer divisions were so badly mauled that they were hardly recognizable as divisions, and they had to be withdrawn from the front for reorganization.

The Kursk battle showed the same characteristics as Von Arnim's campaign in Tunisia some months earlier, and as Von Rundstedt's Ardennes offensive in December, 1944. The German commanders were no longer seeking a decision, they were fighting a delaying action by means of local attacks.

There was no surprise about the Kursk operations. Both sides were fully aware of the movements and concentrations of the enemy. The Germans hoped to effect a breakthrough by weight of metal alone, but the Russian defenses were too strong and the Red Army commanders had learned the importance of unyielding defense, even when the flanks of the position are gone.

The selection of the corners of the salient as the points for their dual attacks was not novel to the Germans. The maneuver, often wrongly described as the *"Cannae manoeuvre,"* is a common one in war and a traditional one to the Germans. Strategically, it was used in Poland, Yugoslavia, and Kiev (to mention only the major examples of World War II); tactically, Rommel attempted something similar at El Alamein (his was, in fact the true *Cannae* plan, although through the action of Alexander and Montgomery it did not succeed).

The Russians timed their counteroffensives well, but as before Stalingrad, the Soviet commanders appeared to lose their grip of the situation once their armies had jumped off in attack. Certainly, they gained great successes during the remainder of the summer and autumn of 1943, but at the start of the advances there was every likelihood of even greater achievement. Time and time again they permitted whole German pockets to slip through their hands, through lack of coördination and an inability to alter the direction of the advance at will.

TANK-CAVALRY COÖPERATION ACROSS THE MIUS—1943

In the Amiens offensive of 1918 the Allies experimented with the use of horse cavalry supported by tanks. The experiment was a failure and observers promptly concluded that mechanization and horseflesh could not be blended. Events in Poland in 1939 appeared—at any rate superficially—to confirm this view. But in the campaigns of 1942 and subsequently the Soviet armies showed the fallacy of this belief.

A notable example of tank-cavalry coöperation occurred during the Russian summer offensive of 1943. While the battles for Orel, Kursk and Kharkov drew the attention of both Russian and German commanders northward there was little activity in the Stalino-Rostov area. As a result when the Soviet armies in the north advanced westwards a re-entrant was left in the Russian front south of the Donetz. On August 22nd the Russian Supreme Command decided to advance Tolbukhin's Army which formed the Soviet left wing. The main struggle farther north had engaged the greater part of the opposing forces and neither Tolbukhin nor the Germans facing him could concentrate large numbers of troops for the operation.

Tolbukhin already held a small bridgehead across the River Mius. On August 22nd the Russian general launched an attack from this bridgehead and cut the Stalino-Tagenrog railway near Amvrosievska. Tolbukhin's tank-cavalry teams now headed southwestward toward the seacoast and Mariupol. By 27th the Germans were in full retreat and the southern bastion of the defense, Tagenrog, was isolated. Three days later it was taken by storm.

The normal employment of the combined tank and cavalry units was, naturally, in open country where large areas could be traversed with little opposition. The capture of the railway at Amvrosievska, which placed Tolbukhin's troops in the rear of the Tagenrog lines, permitted their employment in this manner. Crossing the flat plain the tanks were usually given the task of covering the flanks of the mounted troops. When opposition halted the cavalry, tanks from the reserve went into action, acting as mobile artillery and clearing the hostile strongpoints. When, in the latter stages of the operation, the German counterattacks were coördinated and heavy weapons were brought into action, the cavalrymen dismounted and fought as infantry—or, more accurately, as *dragoons*. The tanks dug in and served as pillboxes in support of the dragoon-manned trenches. Tank-groups were also held in rear to serve as mobile reserves. When the Russian advance was held by the defenses on the Gruzskoy River, the Red commander concentrated all the armor at one point and made a heavy tank attack. As the tanks broke through the German lines the cavalry followed up and exploited the gap.

It will be noted that four separate missions were given to the armor of the tank-cavalry teams. In an advance over open undefended country the tanks served as flank-guards. Tanks were used as supports and reserves for the lightly armed horsemen. Tanks and dismounted cavalry fought in defense. When stiff opposition was met the tanks forced a breach which the cavalry then exploited. In so far as the Cossack horsemen acted as infantry when the need arose they could be styled *dragoons*, but their normal mission was a cavalry one of exploitation; they were not equipped to hold terrain against serious assaults or to attack major defenses.

Tolbukhin's campaign was not the first attempt by the Russians to combine armored and cavalry tactics, but the large scale of the operations attracted widespread attention. Tank-cavalry coöperation was not always as successful, and in 1944 Marshal Malinovsky suffered a serious setback in Hungarian Transylvania through over-dependence on these teams.

ORSHA AND BOBRUISK—1944

By the summer of 1944 the Russian southern front was far in advance of the northern. An immense salient had been formed south of the Pripet Marshes, its apex reaching to Lwow and Kovel (in pre-1939 Poland) and its left flank resting on the Dniester and the eastern slopes of Carpathian Mountains. The Pripet Marshes effectively cut the southern fighting zone from the northern sector so that in fact the two areas were independent of one another, but it was not possible for the Red forces to extend the salient in South Poland and farther west until their comrades had advanced over the Upper Dnieper and thus straightened the front once more.

Through the months of May and June the preparations for the northern offensive were made. On June 22nd the attack was launched along the entire front from Vitebsk to Zhlobin. The Soviet drive followed the route taken by Kutusov and Tschitschagov as they pursued Napoleon in the winter of 1812; the ultimate objective of the 1944 advance being—as Kutusov's had been—to seize Minsk and cut off the hostile armies north of the River Niemen. The initial tasks were therefore the seizure of Vitebsk, Orsha, Mogilev and Bobruisk.

The Soviet Army Groups (or *Fronts**) were given objectives as follows: General Bagramian's *1st Baltic Front* and General Chernyakovsky's *3rd White Russian Front* were to attack Vitebsk; Chernyakovsky's left wing was responsible for the offensive against Orsha; Mogilev was to be assaulted by Colonel-General Zakharov's *2nd White Russian Front,* and General Rokossovsky's *1st White Russian Front* was to move against Zhlobin and Bobruisk.

The German *"Panther Line,"* which had been prepared and fortified during the spring, ran northward along the Dnieper from Zhlobin to Orsha and thence along the Orsha-Vitebsk railway to the River Dvina. The defenses consisted of a series of fortified trench systems, covered by minefields and wire obstacles. They were repeated at intervals, to give depth to the defense, and at some places the belts of trenches extended for seventy miles in depth. The trenches were continuous, and one German humorist stated that it was possible to walk from Leningrad to the Black Sea without appearing above ground level.

The German *Central Russian Group,* commanded by Field-Marshall Busch, consisted of four Armies. In the north the Third Panzer Army was held near the River Dvina; the Orsha-Mogilev sector was defended by the Fourth Army; the Ninth Army covered Bobruisk, and the Second Army watched the northern flank of the Russian salient into Poland from the neighborhood of Pinsk.

Orsha was defended by the XXVIIth Corps of the Fourth German Army. One motorized and three infantry divisions were disposed along the *"Panther Line"* where it left the course of the Dnieper, and eight brigades were in reserve before Orsha. The right wing of the Corps rested on the river, the left ran across marshy ground and woods (*see map of Orsha and Bobruisk*).

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*These *Fronts* or *Army Groups* are misleading, if one attempts to compare them with the *Army Groups* of the Western Allies. The Soviet *Fronts* were in actual fact only comparable to a British or U.S. *Army.*

For the purpose of the record, the Russian *Fronts* about this time were (from north to south): Leningrad Front, Volhovo Front, 2nd Baltic Front, 1st Baltic Front, 3rd White Russian Front, 2nd White Russian Front, 1st White Russian Front, 1st Ukrainian Front, 4th Ukrainian Front, 2nd Ukrainian Front, 3rd Ukrainian Front.

On June 23rd the Soviet attack was mounted. The main effort was made north of the Dnieper, against the left of the XXVIIth Corps. The first line of trenches and part of the second were taken by the Russian infantry-artillery teams in concentrated attacks. Although the defenders committed some tanks and self-propelled artillery, their counter-efforts failed to close the gaps driven by the Red troops.

On the next day the Russians resumed their advance across the marshy ground, driving a salient ten miles deep and ten miles wide. Having room now to maneuver and being on firmer and more open terrain, Soviet tanks and self-propelled guns were sent into action. These finally broke through the defenses and turned the flank of the German division. German reserves were thrown in, supported by a number of tanks, but the Soviet infantry had moved in close support of their armor and had consolidated the ground won. On this day, too, events farther north were favorable to the Russians; between Orsha and Vitebsk another breakthrough had been achieved which further jeopardized the German position.

June 25th saw the heaviest fighting about Orsha. A series of German counterattacks resulted in large-scale battles in which the armor of both sides played an important part. But by evening the Russians retained the initiative and the final breakthrough was accomplished; advances of up to fourteen miles were made and on the 26th Soviet armored and motorized units were well to the west of Orsha, where they cut the German communications with Borisov. The city was now isolated. East of Orsha Soviet forces crossed the Dnieper below the river-bend and on the following day the city was taken by the converging attacks of Red Army troops from east and west.

On June 24th, the day after Chernyakovsky's assault on the Orsha position opened, the 1st White Russian Front commenced the attack on Bobruisk. The line here ran from the south of Gomza to the Dnieper near Zhlobin and thence to Rogachev. The first line consisted of five or six continuous trenches protected by mines and tank barriers. The defenses were manned by elements of the Ninth German Army and comprised two panzer and eleven infantry divisions, supported by other arms. Bobruisk itself was prepared for defense.

As the Russians already held Rogachev it was probably expected that the main effort would come from the Druth line. On the night of June 23-24th Russian troops bridged the Druth north of Rogachev, under heavy German artillery fire, but at the same time the main attack was launched in the south, near Shatsilki. By evening of 24th these southern columns had captured the first line of German trenches and had actually broken through south of Parichi on a front of eighteen miles and to a depth of six miles. As soon as the gap was secured Soviet tanks were sent through and entered Gomza on the same day. The Germans counterattacked from Parichi, committing panzers against the flank of the Russian wedge, but the Red troops held their ground.

On the next day one Russian mobile column moved from Gomza toward Glutsk while another advanced northward along the Gomza-Bobruisk railway. The Germans continued to counterattack west and south of Parichi but the Russian troops had consolidated their position and suffered no serious loss of ground.

During June 25th the Soviet infantry had been following the armor, but the tank formations were moving so rapidly that they were soon more than ten miles ahead of the supporting troops. On 26th, while the infantry approached Brobruisk from the south, Russian armor was already north of the city on the west bank of the Beresina. Bobruisk was surrounded.

Soviet tanks also penetrated to Glutsk, which was captured on the evening of 26th.

On the west bank of the Druth, near Rogachev, the fighting was more severe, and it was not until June 26th that the Russians reached and crossed the River Dobysna. Then tanks were thrown in on a narrow front and swinging northwards, succeeded in cutting the road to Mogilev. This move toward the north turned the flank of the defenses and Startzy was rapidly captured. By evening the tank columns were on the east bank of the Beresina, only two miles from Bobruisk. On the following morning the infantry joined the armored units here.

By June 27th the Ninth German Army was cut in two. The portion west of the Beresina was trapped in Bobruisk while the troops on the east bank were forced southward from the neighborhood of the city. A large-scale counterattack by the latter group (the XXXVth Corps, containing one infantry and two panzer divisions) sought to break through the encircling Russians towards the north, but the Soviet forces defended stubbornly, using their armor as improvised pillboxes. On the next day the Russians closed in from north, south and east and by afternoon the entire pocket was liquidated.

On the night of 28-29th the German units in Bobruisk made an attempt to escape from the city. Infantry and panzers attacked in a northerly direction, at the point where the investing forces were weakest. Some tanks succeeded in passing through the Russian cordon, but most of these were rounded up during the subsequent "mopping-up" operations. The remainder of the Germans were held in the city despite their numerous efforts to escape, and on June 29th—two days after the fall of Orsha—Bobruisk was taken.

The similarity between the Orsha and Bobruisk operations is striking. In both cases the defenses were partly along a river and partly across open country. In both cases the Soviet main effort was made so as to avoid a river crossing. In both cases the armor of the main effort broke through to the rear of the town, so that the defenders were taken from behind by tanks and in front by infantry. Tactical encircling moves of this type were carried out again and again as the Russians approached defended cities and strongpoints.

The Russian use of dug-in tanks as pivots for the defense was not original, for the Germans had long since learned to appreciate the value of panzers used in this manner. As the war progressed all the belligerents tended more and more frequently to use their armor thus, for as the caliber of the weapons mounted on the tanks grew larger the value of tanks as artillery pieces became increasingly apparent.

Undoubtedly Soviet air superiority was an important aid in this offensive. The casualties inflicted on the ground forces by aerial attack were negligible, but the Germans were prevented from maneuvering in the open (where there would have been heavy casualties) and were thus pinned down and easily dealt with. Air support was concentrated against the German XXXVth Corps pocket east of the Beresina and both disorganized the German efforts to break out of the encircling ring and made the final task of mopping up by the Soviet troops much simpler.*

The terrain on the upper reaches of the Dnieper was less favorable to armored movement than the southern steppes, being broken with marshes, woods, small streams and occasional ravines. Soviet tank commanders learned that even where there was little or no opposition it was more economical to avoid these obstacles which would delay the advance. In the attack on Bobruisk some of the columns which by-passed the city to the west increased their journey by as much as one-third the distance in order to escape broken ground of this nature.

The June offensive brought rich results to the Red Armies. Vitebsk, at the northern end of the *"Panther Line,"* fell two days before Orsha. Slutsk, the next important communications center after Bobruisk, fell on June 30th. Converging columns took Minsk on July 3rd. Brest-Litovsk was finally captured on July 28th and the northern and southern fronts, now in line, made contact west of the Pripet Marshes.

The fact that the four key points of the *"Panther Line,"* Vitebsk, Orsha, Mogilev and Bobruisk, could be taken in so short a time may appear strange in view of the German efforts at defense. Physically the defenses were undoubtedly very powerful. But two factors played against the Germans. The first was the knowledge that the *"Panther Line"* represented in fact the apex of an immense German salient, whose right rear, over three hundred and fifty miles to the southwest, was already threatened by the Soviet advances in Poland. With the Red Army knocking at Germany's front door, the troops holding a defense line miles away in Russia could not help but feel that they were wasting their time. Furthermore, although the lines of trenches were prepared and the obstacles erected, the manpower of the defenders was sadly deficient. To speak of "divisions" is misleading, for the German division was a unit much understrength in 1944.

The second factor in the rapid penetration of the *"Panther Line"* is a corollary of the first. As the German forces grew weaker the Russian grew so much stronger. Battle-trained men and fresh recruits were pressed forward in hundreds to fill the Russian establishments. Also the situation with regard to equipment was easing rapidly, as more and more material was delivered to the Army commanders from the three sources of supply—the Russian factories, the Western Allies and the captured German depots.

(To be concluded)

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*Russian *Stormovik* armored aircraft were employed for tasks of this nature.

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. . . The Field Marshal (von Schlieffen) . . . always endeavored . . . to keep alive in the General Staff and thus in the army at large, the idea of a war of annihilation. . . . Hence in his writings he often attributes his own ideas to the leaders of the past—among them Moltke—when he wishes to prove that to achieve a decisive victory of annihilation, *outflanking*—preferably from two or three sides—must be resorted to as Hannibal did at Cannae. Modern battles, Count Schlieffen characterizes even more than earlier battles as a "struggle" for the "flanks." . . . Except for Tannenberg, a real Cannae did not occur in the World War. That one did not occur in the West at the beginning of the war is the fault, in the first instance, of the Supreme Command. Indeed, it was the Schlieffen Plan on which our operations were based, yet in their actual execution it was departed from. His constant exhortation to make the right flank as strong as possible was not heeded.—BARON VON FREYTAG-LORINGHAVEN, General of Infantry, German Army, 1925.

Armored Task Forces★

by Lieutenant Colonel Patrick H. Tansey, Jr.★★

THIS article is not an attempt to justify the use, formations and tactics of armor as employed in the European Theater of Operations, but to present in general a clear idea of one way the armored divisions actually fought through France, Belgium, and Germany. Before we start, let us first of all understand the meaning of the term "Armored Task Forces."

Normally the combat commands of the armored divisions were divided into two or three small forces of combined arms—these were called task forces. The combat elements of an armored division consisted of three tank battalions, three armored infantry battalions, three armored field artillery battalions, one armored reconnaissance squadron, one armored engineer battalion, plus the normal attachments of one tank destroyer battalion, and one antiaircraft automatic weapons battalion self propelled, plus attached field artillery varying from one battalion to a group.

The armored divisions were normally subdivided into three equal combat commands. The average combat command was composed of a headquarters and headquarters company, combat command; one tank battalion; one armored infantry battalion; one armored field artillery battalion, either attached or in direct support; one armored engineer company; one tank destroyer company; and one battery, antiaircraft artillery automatic weapons, self-propelled.

Most of the thirteen light armored divisions in the European Theater of Operations (2d and 3d Armored Divisions under T/O&E 17, 1 March 1942 are considered heavy armored divisions) normally used the following type of task force organization at one time or another. The combat command (CC) was divided into two task forces (TF). The remainder of the tank destroyer and armored engineer companies, and the entire antiaircraft automatic weapons battery composed the combat command reserve. The armored field artillery battalion was placed in direct support of both task forces. We see that TF 1 was heavy in tanks, having two medium tank companies to one armored infantry company. TF 2, on the other hand, was heavy in infantry, having two armored infantry companies to only one medium tank company.

TF1[1]	*TF2*[2]
TK Bn (-1 Med Tk Co)	Armd Inf Bn (-1 Armd Inf Co)
1 Co Armd Inf	1 Med Tk Co
1 TD Plat	1 TD Plat
1 Armd Engr Plat	1 Armd Engr Plat

The fact that these task forces were unbalanced was a disadvantage since the CC commander seldom knew what type of resistance he would encounter in his zone of action before he committed his TFs to specific routes. Often he discovered that it would have been better to have had these TFs switched, but by the time that information was known it was too late to make the change. An equal proportion of tank platoons to infantry platoons would have been more desirable, but could not be obtained without splitting front-line companies, which proved unfeasible due to administrative difficulties. The big advantage that this task force possessed was the fact that it contained all the combat arms in sufficient proportion under a definite commander, a battalion commander who had the necessary staff, communication, supply and administrative facilities from his own battalion headquarters to assist him in maintaining control.

The organization of the armored division into task forces proved itself to be especially adapted for pursuit when the terrain and roadnet permitted. Armored divisions with two combat commands abreast—each having two task forces abreast—can cover wide fronts, the distance between the task forces being limited to the range of the artillery in support. This means that the division, marching on four routes, is provided great flexibility in being able to bypass strong resistance encountered on any one route.

The march formations of armored task forces were organized as follows:

TF 1		*TF 2*	
Advance Guard	*1 Med Tk Co 1 Armd Inf Plat Assault Gun Plat (Tk Bn) 1 Armd Engr Plat	Advance Guard	*1 Armd Inf Co 1 Med Tk Plat Assault Gun Plat (Armd Inf Bn) 1 Armd Engr Plat
Flank Guard	1 L Tk Co	Flank Guard	MG Plat (Armd Inf Bn) Rcn Plat (Armd Inf Bn)
Main Body	*Hq & Hq Co (-) Tk Bn *Med Tk Co Armd Inf Co (-) TD Plat Medical Det Maint	Main Body	*Hq & Hq Co (-) (Armd Inf Bn) *Armd Inf Co Med Tk Co (-) TD Plat Medical Det Maint

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*Artillery Forward Observers Accompanied.

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[1] This TF is commanded by the CO of the Tank Battalion.

[2] This TF is commanded by the CO of the Armored Infantry Battalion.

★Military Review.

★★Instructor, Command and Staff College.

Now let us look at the advance guards since most of the fighting was done by them. We see that it is commanded by a company commander whose company is the main fighting force—either tank or armored infantry. There is a platoon of tanks or infantry to work with this company. The point usually is a platoon of tanks and a platoon of armored infantry. The advance guard commander has an artillery forward observer with him. The 105mm assault gun platoon is with the advance guard to assist in eliminating road blocks by direct fire. An engineer platoon is with the advance guard for the same purpose—to eliminate road blocks by direct action, that is, to clear minefields and booby-trapped road blocks as rapidly as possible, and to assist in bypassing small blown bridges by selecting, improving, and maintaining fords. Having these attachments well forward with the advance guards saves a great deal of time, and enables the armored columns to keep hot on the enemy's heels. As in all advance guard action, these task force advance guards were committed rapidly and aggressively. Usually when the main body was committed it too was employed with speed—many times directly from march column.

As far as can be determined by the author from after action reports of the armored divisions operating in the ETO, the assistance which the task forces gave one another was indirect rather than direct in most cases. By this I mean that if TF 1 of a combat command was stopped by strong enemy resistance and TF 2 managed to get through, then it kept driving forward, usually causing the resistance in front of TF 1 to withdraw by the mere threat of TF 2's location. There was another reason for indirect rather than direct support—this was the air support provided for the armored columns by the Tactical Air Command. If a TF was stopped by strong resistance, an air strike or two on the enemy position would jolt him sufficiently to enable the TF to continue forward. It is difficult enough to coördinate an air strike without having to worry about a friendly column coming into the target area from the enemy's rear or flank. Besides, it is faster to get a strike than to have a column change direction and get set for a coördinated attack.

Let me quote an historical account of a fine example of efficient task force operation by the 6th Armored Division in pursuit operations.

"During the drive into Central Germany the 6th Armored Division was directed to seize Mühlhausen, a city of thirty thousand inhabitants.

"On the night of 3-4 April 1945 one bridge over the Werra River was captured intact. The division crossed on this bridge, Combat Command 'B' leading, followed without distance by Combat Command 'A.' Vehicles were crossed without distance as enemy air was not active and speed was necessary. The flow of traffic over the bridge was never halted.

"CC 'A' was ordered to close in on the city from the north and northwest, CC 'B' ordered to close on the city from the south and southwest. A hasty reconnaissance was made by combat commanders and their task force commanders. Each of the combat commands had three task forces. Under CC 'A' were Task Forces 15, 68 and 9; under CC 'B' were Task Forces 50, 69 and 44. The tables below show the composition of these Task Forces.

"CC 'B' assembled near Heyerode, CC 'A' southwest of Eigenrieden. (See Sketch) Both commands started the encirclement of Mühlhausen simultaneously.

"Opposition was light. Small forces of enemy infantry were cleared up from the small towns adjacent to Mühlhausen. Antitank fire was encountered by TF 15 in Bickenriede and in Dachrieden and was quickly overcome. TF 15 and TF 69 both bypassed Mühlhausen as if to continue east, then TF 15 turned south, then west, and blocked all eastern exits of the city. Meanwhile TF 69 drove past the city and blocked from the north and east. By dusk all task forces were in position as shown on sketch, and held Mühlhausen in a vise-like grip. The division commander decided that the attack to clear the city would be launched at 0700, 5 April 1945. All artillery was emplaced so as to give support if heavy resistance was encountered. All task forces held in place except TF 9 and TF 50, which drove into the city. Sporadic street fighting was encountered. Some three or four hundred prisoners were taken in the town, whereas some twelve hundred were gathered in by TF 15 as they tried to flee eastward.

CC "A"

TF 15	*TF 68*	*TF 9*
15 Tk Bn (-1 Med Co)	68 Tk Bn (-1 Med Co & 1 Lt. Co.)	9 Armd Inf Bn (-1 Co)
Armd Inf Co	Armd Inf Co	Med Tk Co
TD Plat	TD Plat	TD Plat
Armd Engr Plat	Armd Engr Plat	Armd Engr Plat
212 Armd FA Bn		274 Armd FA Bn

CC "B"

TF 50	*TF 69*	*TF 44*
50th Armd Inf Bn (-1 Co)	69th Tk Bn (-1 Med Co)	44th Armd Inf Bn (-1 Co)
Med Tk Co	Armd Inf Co	Med Tk Co
TD Plat	TD Plat	TD Plat
Armd Engr Plat	Armd Engr Plat	Armd Engr Plat
231 Armd FA Bn	128 Armd FA Bn	

"The city was cleared by 0930, 5 April 1945, with a minimum of losses. The enemy troops were well equipped and had excellent morale. It was learned upon questioning the German officers that the rapid encirclement had completely disrupted their plan of defense; thus the quick capitulation of the entire garrison."

* * * *

Amphibious Reconnaissance

by First Lieutenant Robert R. Nelson, Jr.*

Information gained by a patrol—even though the mission cannot be completed—is many times of great importance to its own as well as to other units.

FINAL preparations had been made by XX Corps to cross the Rhine River in the vicinity of Mainz on the night of March 27-28, 1945. The XX Corps had been assigned a sector of the Rhine from Eltville to the confluence of the Rhine and Main Rivers.

The initial crossing of the Rhine by Third Army troops had been made on the night of March 22-23, in the vicinity of Oppeheim by XII Corps. On March 25, the VIII Corps crossed the Rhine at Boppard and then on March 26, the same Corps crossed again at Oberwesel.

Because of these crossings, as well as the crossings that had been made at Remagen by the First U.S. Army and at Wesel by the 21st Army Group, the Rhine River no longer possessed any strategic importance to the Germans.

Nevertheless, to the infantrymen of the XX Corps, who were to cross in the vicinity of Mainz, the river still constituted a formidable tactical barrier. Where the crossing was to be made, the Rhine reaches one of its widest points, with a water gap of nearly 2,000 feet. The current in this sector averages 2.39 miles per hour and attains a speed of 5.80 miles per hour at highest navigable levels. Cover on the German side of the Rhine was fairly good, so the chief obstacle was the river's width.

Intelligence reports indicated that one regular German divisional unit (about 7,000 troops) was located on the immediate front of the Corps.

Although the VIII and XII Corps had already established bridgeheads across the Rhine on both flanks of the XX Corps, an additional crossing was necessary to gain possession of the Mainz-Wiesbaden-Frankfurt roadnet. The Third U.S. Army at the time enjoyed a considerable numerical superiority over the enemy, and it could thus continue its rapid advance beyond the Rhine.

The 80th Infantry Division, with the 16th Cavalry Reconnaissance Group attached was ordered to make the Rhine crossing. The Division planned to send the 317th Infantry across the Rhine at Mainz, passing just south of St. Peter's Island. The main assault forces were to land at the northwest outskirts of Kastel.

On March 26, 1945, each reconnaissance troop of the 16th Cavalry Reconnaissance Squadron, Mechanized, was ordered to send one patrol across the Rhine that night on the following missions, for the 80th Division.

1. Send patrol across the river for bridge crossing information. Patrols to return at 0300, March 27.
2. Essential elements of the information desired:
   a. Can patrols cross the river and land undetected.
   b. Is there enemy within a 500-yard semicircle of the patrol's landing site.
   c. What is the location or direction of movement, strength, disposition, and composition of enemy encountered.

Plans of the patrol called for the use of a reconnaissance platoon's regular rubber boat, which will hold three men and a little additional equipment. It was decided that each of the three men would carry a pistol and a submachine gun. One SCR Radio, netted with troop headquarters, was also taken along.

Because little time was available, the patrol moved into the 3d Platoon's OP on the river for a hurried view of the opposite shore. The OP was in a three-story railroad bridge tower, the height of which gave the patrol good observation of the opposite shore, the town of Biebrich, and the two islands in Troop C's zone.

The writer, who led this three-man patrol from Troop C, decided to let the rubber boat drift downstream between the two islands and land in a wooded area at the west end of the town. No enemy activity had been observed on St. Peter's Island, but foxholes were visible. Rettberg Island, however, was alive with enemy activity.

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*Cavalry School Student.

The patrol planned to leave from a point about 50 yards up the river from the railroad tower OP, on the right flank of Troop C's zone. A church overlooking the river from the center of Biebrich was selected as the patrol's objective. The patrol was to move around through the town, stop at the church, and then move back to the rubber boat in the woods.

Arrangements were made with Troop A for the patrol to land in the 2d Platoon's area at Budenheim upon the patrol's return at about 0300 hours on the morning of March 27, 1945.

Much enemy activity was observed on the German side of the Rhine, and it was assumed that if a landing was successful it would soon become too hot for the patrol to stay. Machine-gun nests were spotted along the banks at 50-yard intervals, and many enemy were seen moving about. Because of American crossings on both flanks in the XX Corps Zone, artillery fire could not be requested. However, the 1st and 3d Platoons of Troop C were in position to support the patrol with .30 and .50 caliber machine guns, 37s, and 60 and 81mm mortars.

Members of the patrol wore wool knit caps and sweaters and each man carried an extra magazine of SMG ammunition, which was taped to the magazine loaded in the gun, and also two extra pistol clips. In addition each soldier had three hand grenades, hung from belts—one each of fragmentation, white phosphorus, and concussion types. After study of the ground, maps, and aerial photos in which dangerous localities were noted and orientation check points selected, the patrol checked equipment and made final preparations for the departure.

At 2000 hours the patrol was ready to "jump-off." After waiting an hour for darkness and seeing that a bright moon was rising, it was decided to make the crossing early before the moon rose too high. The patrol wanted also to take advantage of the evening mist which was settling over the river and masking some of the moon's brightness.

The patrol pushed off at 2100 hours. Each patrol member had a boat paddle which was used for slowing speed and steering. Paddling was too noisy.

Reconnaissance boats are oval in shape and flat-bottomed, which make them difficult to handle because of their spinning. The patrol made its way to a point between the two islands where it stopped and listened. The current was less strong here. Activity was heard in Biebrich and also in the wooded area west of the town, which had been chosen as the original landing point. A new landing point directly in front of the patrol's present position between the two islands was selected, where all was quiet.

When the patrol was within 20 feet of the new landing site it spotted a sentry walking on the road just above the river bank. This changed plans, and the boat was allowed to drift downstream.

When the patrol reached a point opposite to the church in Biebrich, two or three boats anchored off shore were found. It was decided to drift in to the three boats, tie up the patrol's boat to the German boats, and swim ashore. But, when the patrol was within an arm's reach of the newly discovered boats a German sentry appeared and called out to the patrol. The patrol froze into position and let its boat continue to drift downstream. The German sentry failed to take any action.

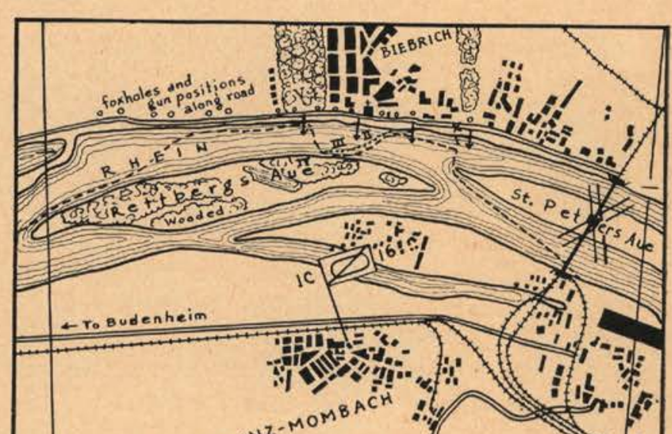
Just after this a German boat was observed being paddled down the river. It came to within 30 feet of the patrol's boat but the river mist was heavy at the time and the Germans failed to see the patrol.

It apparently was impossible to land on the German side of the river, and so the patrol returned, landing on its own shore at 0030, March 27, 1945.

The patrol in three hours and 30 minutes had located several machine-gun positions, enemy positions on the two islands, and enemy positions on the German side of the Rhine.

One difficulty the patrol experienced was due to its lack of experience with rubber reconnaissance boats. It therefore had trouble maintaining a straight course and keeping the boat from spinning. The boat itself is clumsy and hard to paddle, and it rides so low in the water under a load that it ships water. However, the boat is easy to inflate and deflate and is light though cumbersome.

Although the patrol did not make a landing, the information it obtained proved to be of great value to the 16th Cavalry Reconnaissance Squadron and the 80th Division, when they crossed the Rhine the following night.



Armored School Extension Courses

*by 1st Lieutenant Olin C. Harrison**

ARMY extension courses are slated to play an important part in the postwar education of reserve officers. The Armored School at Fort Knox, Kentucky, has announced that it is already accepting applications for enrollment in its courses.

These courses are of particular interest to reserve officers in the Armored and Cavalry branches, since satisfactory completion of a prescribed series of extension sub-courses will be a requisite for their promotion.

Carefully selected officers at The Armored School are being assigned to write, edit and grade the various extension courses. These courses will cover everything from basic military instruction in the 10-series course, to combat command operations and staff functions in the 50-series course.

The courses will be available to all ranks up to and including majors. However, only the first five of the 50-series course, for majors, will be administered by The Armored School. All sub-courses after the first five are the responsibility of the Command and Staff College at Fort Leavenworth, Kansas.

Established by army regulations, the Extension Course Department of The Armored School has been in operation since July 30, 1946. The department is composed of four divisions: an editorial division, which works with other School departments in preparing sub-courses; an operations division, which processes applications and disseminates sub-courses to students; an instructor division, which grades students' solutions; and an administrative division, which maintains the necessary records.

The regular instructional departments of the School—Tactics, Weapons, Automotive, Communications, and General Instruction—do the actual compiling and writing of the courses.

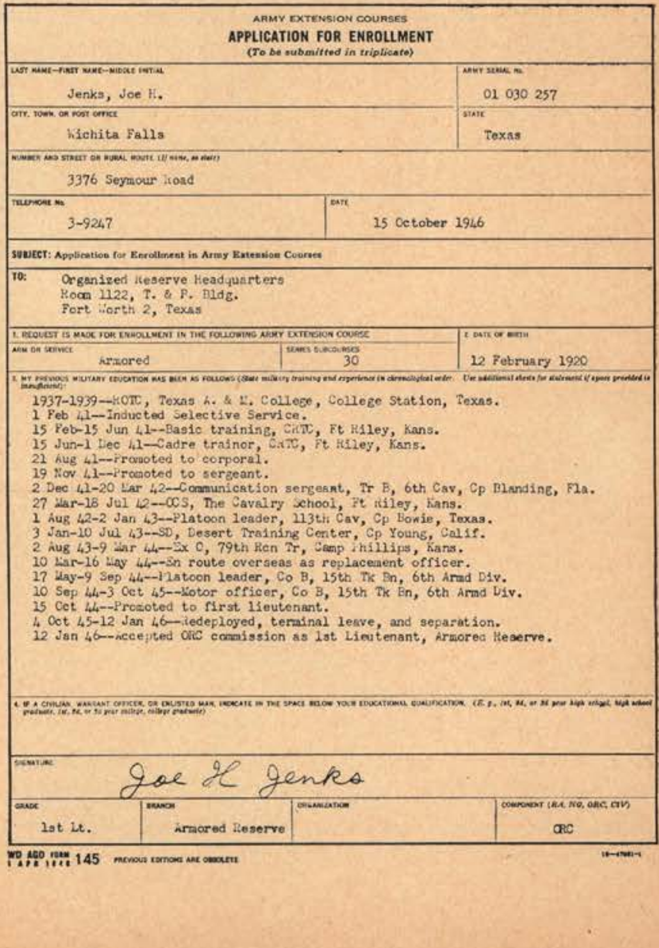
Every officer who works on extension courses at The Armored School must have combat experience. The School commandant and all department directors concerned exercise close supervision over all courses.

Following is a typical case in the preparation of a 30-series subject: Tactics of the Tank Company.

The Director of the Tactics Department first selects an officer to write the course who commanded a tank company in combat for several months and later was a battalion S-3 in action.

First, the officer selected studies all the field manuals, technical manuals, and other publications relating to his subject. Then he prepares a detailed outline of the entire sub-course, including the scope of each lesson and the tactical principles involved. This outline is presented at a conference attended by his division chief and department director. By the end of the conference the outline is thoroughly formulated and ready for expansion into a sub-course.

The officer then writes the course, including the lesson being considered in this article. He stresses practical work based on the text assignments available, putting hypothetical situations and requiring students to work out the solutions to those problems. He will probably include an overprinted map to be used by the student in working out the solutions.



ARMY EXTENSION COURSES
APPLICATION FOR ENROLLMENT
(To be submitted in triplicate)

LAST NAME—FIRST NAME—MIDDLE INITIAL Jenks, Joe H.	ARMY SERIAL No. 01 030 257
CITY, TOWN, OR POST OFFICE Wichita Falls	STATE Texas
NUMBER AND STREET OR RURAL ROUTE (If none, so state) 3376 Seymour Road	
TELEPHONE No. 3-9247	DATE 15 October 1946

SUBJECT: Application for Enrollment in Army Extension Courses

TO: Organized Reserve Headquarters
Room 1122, T. & P. Bldg.
Fort Worth 2, Texas

1. REQUEST IS MADE FOR ENROLLMENT IN THE FOLLOWING ARMY EXTENSION COURSE

ARM OR SERVICE Armored	SERIES SUBCOURSES 30	2. DATE OF BIRTH 12 February 1920

3. MY PREVIOUS MILITARY EDUCATION HAS BEEN AS FOLLOWS (State military training and experience in chronological order. Use additional sheets for statement if space provided is insufficient):

1937-1939—ROTC, Texas A. & M. College, College Station, Texas.
1 Feb 41—Inducted Selective Service.
15 Feb-15 Jun 41—Basic training, CRTC, Ft Riley, Kans.
15 Jun-1 Dec 41—Cadre trainor, CRTC, Ft Riley, Kans.
21 Aug 41—Promoted to corporal.
19 Nov 41—Promoted to sergeant.
2 Dec 41-20 Mar 42—Communication sergeant, Tr B, 6th Cav, Cp Blanding, Fla.
27 Mar-18 Jul 42—OCS, The Cavalry School, Ft Riley, Kans.
1 Aug 42-2 Jan 43—Platoon leader, 113th Cav, Cp Bowie, Texas.
3 Jan-10 Jul 43—SD, Desert Training Center, Cp Young, Calif.
2 Aug 43-9 Mar 44—Ex O, 79th Rcn Tr, Camp Phillips, Kans.
10 Mar-16 May 44—En route overseas as replacement officer.
17 May-9 Sep 44—Platoon leader, Co B, 15th Tk Bn, 6th Armd Div.
10 Sep 44-3 Oct 45—Motor officer, Co B, 15th Tk Bn, 6th Armd Div.
15 Oct 44—Promoted to first lieutenant.
4 Oct 45-12 Jan 46—Redeployed, terminal leave, and separation.
12 Jan 46—Accepted ORC commission as 1st Lieutenant, Armored Reserve.

4. IF A CIVILIAN, WARRANT OFFICER, OR ENLISTED MAN, INDICATE IN THE SPACE BELOW YOUR EDUCATIONAL QUALIFICATION. (E. g., 1st, 2d, or 3d year high school, high school graduate, 1st, 2d, or 3d year college, college graduate)

SIGNATURE Joe H Jenks

GRADE 1st Lt.	BRANCH Armored Reserve	ORGANIZATION	COMPONENT (RA, NG, ORC, CIV) ORC

WD AGO FORM 145 1 APR 1946 PREVIOUS EDITIONS ARE OBSOLETE

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*Armored School Extension Course Editor.

The next step in the preparation of the lesson is to test it out. The officer, who is preparing the course, arranges for several lieutenants from other departments to be detailed to him for this phase, and the lesson is submitted to them. The lieutenants endeavor to solve the lesson and their solutions are carefully studied. If several miss a requirement, the author of the course assumes that the requirement is either too difficult or else it is not clearly presented to the student.

The necessary changes are made and the lesson is then ready for presentation to a board of officers who will make the final decision. This board (sometimes called the "Murder Board") takes the lesson apart word by word. The board may approve the lesson with or without changes, or direct that it be rewritten.

An editing officer is available to the author of each course for consultation at any time on questions of format and syntax. Then the course is written up in its final form and turned over to an editing officer for a final check.

The lesson is then forwarded to Headquarters Army Ground Forces for final approval. When AGF gives its final O.K. it is ready for distribution to students.

To enroll for extension courses the student is required to fill out WD AGO Form 145, which can be secured from the local Reserve Headquarters.

When the enrollment blank has been submitted and approved, the student receives the first lesson of the sub-course he is enrolled for. The lesson material includes a lesson assignment sheet, which gives the text assignments; materials required, and any other information necessary to prepare the student for solving the lesson requirements. It also includes an answer sheet, which gives the requirements and provides space for the student to write his answers.

When the solution sheets are returned, they are given to an officer who grades them. His job is relatively easy if the requirements are true-false, multiple-choice, or word-completion type. A map problem, or a requirement which necessitates a detailed explanation, is a different matter.

The grading officer does not guess how much to cut if an answer is either wholly or partly wrong. At the time the lesson is prepared, a cut sheet is also made which tells the grading officer just how many points to deduct for each error or omission.

When the lesson is returned to the student a comment sheet is attached. For example, let us assume that the student made an error in the route of advance to an objective. The comment sheet would state that the route of advance was too long, or too exposed, or whatever else was wrong. The solution would show the route which should have been chosen.

The school solutions are not considered to be ironclad. The grading officer has instructions to consider all solutions carefully. If the student hits on a satisfactory solution, or if he follows sound reasoning and proves it by his answer, the student will receive partial credit regardless of the school solution. If the school solution is deemed to be the best of the several possible answers, the solution sheet will include a discussion of the problem, with reasons why the school solution is considered the best. Furthermore, each item of the school solution includes a text reference supporting the answer given.

The extension courses offered by The Armored School are:

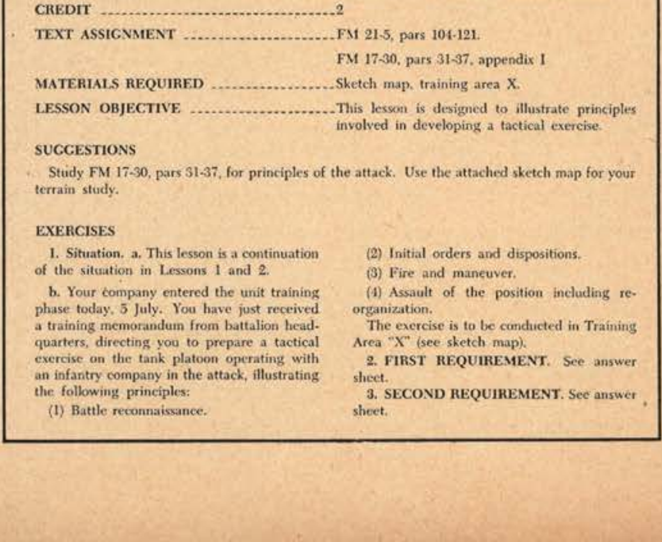
The 10-series of sub-courses designed for warrant officers, enlisted men, and qualified civilians. It includes sub-courses pertaining to general military instruction on such subjects as organization of the armed forces, drill and physical training, interior guard duty, first aid, military law, individual weapons, and basic administration.

The 20-series is designed for second lieutenants, and includes such subjects as methods of instruction, tank gunnery, mines and booby traps, mess management, and tank platoon in combat.

The 30-series, for first lieutenants, includes tank company combat supply, tank company in combat, armored infantry company in combat, troop movement and bivouac, terrain evaluation, and training management.

The 40-series, for captains, teaches such subjects as military government, tank battalion in combat, staff functions in the tank battalion, armored infantry battalion in combat, the armored engineer battalion, and the mechanized cavalry reconnaissance squadron.

The 50-series, for majors, is administered only in part by The Armored School, all sub-courses after the first five being the responsibility of the Command and Staff College. The sub-courses administered by The Armored School cover combat command operations, staff functions, and armored amphibious operations.



EXTENSION COURSE OF THE ARMORED SCHOOL

LESSON ASSIGNMENT SHEET

SUBCOURSE 30-2 .... Training management.
LESSON 3 .... Preparation of applicatory tactical exercises.
CREDIT 2
TEXT ASSIGNMENT .... FM 21-5, pars 104-121.
FM 17-30, pars 31-37, appendix I
MATERIALS REQUIRED .... Sketch map, training area X.
LESSON OBJECTIVE .... This lesson is designed to illustrate principles involved in developing a tactical exercise.

SUGGESTIONS

Study FM 17-30, pars 31-37, for principles of the attack. Use the attached sketch map for your terrain study.

EXERCISES

1. **Situation.** a. This lesson is a continuation of the situation in Lessons 1 and 2.

b. Your company entered the unit training phase today, 5 July. You have just received a training memorandum from battalion headquarters, directing you to prepare a tactical exercise on the tank platoon operating with an infantry company in the attack, illustrating the following principles:

(1) Battle reconnaissance.

(2) Initial orders and dispositions.

(3) Fire and maneuver.

(4) Assault of the position including reorganization.

The exercise is to be conducted in Training Area "X" (see sketch map).

2. **FIRST REQUIREMENT.** See answer sheet.

3. **SECOND REQUIREMENT.** See answer sheet.

Editorial Comment

Christmas Greeting from General Devers

To All Members of the Army Ground Forces:

On the eve of this Christmas season I extend my sincere and hearty greetings to you all.

We regard the New Year with cheer and confidence; dedicating ourselves to the high resolve of preserving our priceless liberty, that "Peace on Earth; Good Will to Men" may become a reality for all time.

JACOB L. DEVERS,
General, USA,
Commanding.

New Ground General School

THE Cavalry School, as a name, passed into history on October 31. In keeping with the announced War Department plans the Army school at Fort Riley becomes The Ground General School Center, teaching several different courses. The new school center will receive its initial impetus from the assets passed on to it by The Cavalry School. These assets are: a complete instructional plant, a going concern of proven efficiency, the spirit and cooperation that made an outstanding record possible. The success of the new school is assured for it begins operations with all of the "know how" The Cavalry School has assembled over the years.

The first beginnings of The Cavalry School, The Cavalry and Light Artillery School, was established in 1887. This was replaced in 1907 by the Mounted Service School. The Cavalry School, as it is known today, succeeded the combined school on September 19, 1919. Many of our Nation's great soldiers have either studied or taught at this famous school. To mention a few: Pershing, MacArthur, Wood, Lear, Patton, Wainwright and Craig.

The old school has performed its mission well. In World War II, five and six-tenths per cent of all General officers had Cavalry backgrounds. This fact is remarkable for of the total officer corps of the United States Army, only one and two-tenths per cent were Cavalry officers.

The Armored Cavalry subjects taught by The Cavalry School will be transferred to Fort Knox, Kentucky, where they will be incorporated into the Armored School. This is in line with the announcement revealed at the Dedication of Patton Hall at Fort Riley on April 4, this year, by Secretary of War Robert P. Patterson, that the historic Cavalry and the comparatively new Armored Force will be merged into a single arm to be known as the "Armored-Cavalry" in recognition of the new developments during World War II.

It is the desire of the War Department to keep alive the art of horsemanship. Gen. Jacob L. Devers, in the press conference held at Fort Riley last April, declared, "Certainly the horse won't be what it was before the war. It will be used as a training instrument for officers. I feel that we have to train officers along those lines—if for no other reason than to keep our hand in. Pack transportation has demonstrated its necessity many times. If we are going on missions where we may not be able to choose the terrain, the art of horsemanship may be extremely important again. This was proven in the late war."

To implement this policy, the new Ground General School will maintain a Department of Horsemanship. This department will continue to teach a very small number of selected officers advanced and intermediate horsemanship and packing. These courses will give the Army a small core of trained horsemen that may in some future time be the key to a critical situation in difficult terrain. In addition to the horsemanship courses there will be taught two enlisted courses—one, the Horseshoers Pack and the other, the Saddlers Pack; thus keeping for the Army two highly skilled arts on which animal transport is vitally dependent.

The new Ground General School will be charged with the task of training, each year, the entire graduating class of West Point. The graduates will be trained in the specific duties from a lieutenant in the Army to a battalion commander. This will be in addition to their general education at the U.S.M.A. and their indoctrination with the traditional officer philosophy of "Duty, Honor, and Country."

In addition to the Military Academy graduates, Reserve and National Guard Officers and graduates of the Army Officer Candidate Course, who have been integrated into the Regular Army, will be assembled at Fort Riley for further instruction and indoctrination before being assigned to duty. These functions of the new school are known as the "Basic Course."

The Army Officer Candidate Course, presently located at Fort Benning, will be transferred to the Ground General School which will qualify or reject all of the officer candidates for the entire Army. The course will be branch immaterial; the candidates who successfully complete the course will receive their basic branch training at their respective schools. It is planned to graduate two classes a year.

The present Intelligence School will become the Intelligence Department of the Ground General School and will be considerably enlarged. There is no contemplated change in the courses as presently taught by the Intelligence School, which are: Officers' Intelligence Course, for the officer students; the Photo Interpreters and the Order of Battle-Interrogators Courses which are for enlisted specialists. The department will be charged with the instruction of all Intelligence Subjects taught by the Ground General School.

After World War I Cavalry was a relatively obscure arm and received little public notice. Because American Cavalry failed to participate as Cavalry to any extent in World War I, the public paid little heed to the magnificent accomplishments of the Cavalry of the other Allies as well as that of our enemy, Germany. American Cavalry after World War I was led by an aggressive group of leaders with vision and foresight. They incorporated into the Cavalry weapons which tended to greatly increase the fire power of the arm and also incorporated motor vehicles to increase the mobility of the arm. Gradually the Cavalry developed an entirely mechanized force which was the forerunner of our Armored Force. It was composed of lightly armored vehicles which were fast and had great cross-country mobility and by the gradual incorporation of other arms, such as Field Artillery and Engineers, produced a balanced mechanized striking force whose missions were the same as those performed by horse cavalry throughout the history of warfare; but the technique of performance of these missions was greatly changed due to the cavalry trooper being carried in a fast armored vehicle instead of on a horse.

It was the vision and foresight of the Cavalry which gave the U. S. Army the basis for the magnificent armored units, which did so much in World War II to accomplish the defeat of the Axis powers. Much of the tactics and technique of the Armored Force stemmed from the basic and advanced indoctrinations given the leaders of these armored units when they received instruction at The Cavalry School.

The transfer of activities of The Cavalry School to Fort Knox is not an act indicative of the abolition of the Cavalry function, but merely a transition and a combination entirely in line with the policy of the U. S. Army to encourage and accept changes which will keep our Army the most modern and effective for peace in the world.

Cavalry Day Dedications

FOUR cavalrymen, three of whom won the Congressional Medal of Honor and one the Distinguished Service Cross with a Cluster, for conspicuous bravery in World War II, were remembered on October 30, Cavalry Day, at Fort Riley, Kansas, when each had a Cavalry School barracks dedicated in his memory.

The barracks were named: Praeger Hall, in memory of Major Ralph B. Praeger of Claflin, Kansas; Waybur Hall, in memory of First Lieutenant David C. Waybur of Piedmont, California; McGill Hall in honor of Sergeant Troy A. McGill of Ada, Oklahoma, and Thorne Hall in memory of Corporal Horace M. Thorne of Desoto, Missouri.

Cavalry Day, selected as the anniversary of the organization of cavalry in the Continental Army on October 30, 1776, was decided upon as the most fitting time to make the dedication to these four cavalry heroes.

Major Praeger was awarded the DSC with an Oak Leaf Cluster for his command and distinguished service as a Guerrilla leader in the Philippines after the fall of Corregidor. When the Japs invaded the Philippines he was in command of Troop C, 26th Cavalry, Philippine Scouts.

Lieutenant Waybur on July 17, 1943, volunteered to lead a patrol into enemy territory in Sicily to locate an isolated Ranger unit. When trapped by four light Italian tanks he ordered his patrol, armed with one .30 caliber and two .50 caliber machine guns, to engage the enemy. With ammunition exhausted, three of his men wounded, and himself seriously hit, Lieutenant Waybur stood with his .45 caliber Thompson submachine gun in bright moonlight directly in line of the leading tank's fire and succeeded in killing the two enemy crew members with point-blank fire at 40 yards.

Sergeant McGill was awarded the Medal of Honor for heroism in action on Los Negros Island in the Admiralties, for singlehandedly standing off an attack by drink-crazed Japs on a critical key position.

Corporal Thorne won his Medal of Honor for valor during the German counterattack late in 1944. He neutralized an enemy tank by killing the occupants and forcing the supporting machine guns and bazooka team to withdraw in confusion.

* * *

Annual Meeting

The annual meeting of the United States Armored Cavalry Association will be held at the Army and Navy Club, Washington, D. C., at 8 P.M., Monday, January 27, 1947.

This meeting is held for the purpose of electing officers and for the transaction of such other business as may properly come before the meeting.

Armored Division Association

2d Armored Division Association

FORMATION of the Second Armored Division Association has been announced by Captain George M. Warren, Acting G-1 of the Division, who is handling the drive for members. The Association, which will function as a social, informative and historical agency, will have its temporary home at Camp Hood, Texas.

At the present time, pending the adoption of a constitution and by-laws, a promotion committee, whose duties are to handle everything pertaining to the Association, has been appointed.

Major General Isaac D. White, Commandant of The Cavalry School, called a meeting at Fort Riley, Kansas, for all former members of the Second Armored Division and sent to the committee the various ideas of this group as pertains to the formation of the Association.

Colonel Reddin F. Perry, a former Chief of Staff of the Division, held a similar meeting of "Hell on Wheelers" at Fort Knox, Kentucky. This group also forwarded plans and suggestions to the committee.

Names and addresses of the committee are: Lt. Col. Louis W. Correll, Hqs. 2d Armored Division; Lt. Col. Marcel F. J. Brunow, Historical Division, War Department; Major Louis M. Nawrocky, Sixth Tank Bn.; Capt. George M. Warren, Hqs. 2d Armored Division; and 1st Lt. William W. Barnett, Jr., 78th Armored Field Artillery Bn.

Mr. W. M. Kabler, former adjutant of the 17th Engineer Battalion and now a lawyer in civilian life, has been contacted and has consented to draw up a constitution and by-laws to be submitted to the promotion committee for approval.

The officers of the Association will be civilians, with their headquarters tentatively at Camp Hood, Texas. Membership will be open to anyone who has served in the Division, either overseas or in the United States.

Captain Warren is anxious to contact all former members of the Division so as to bring the address file up to date. "We do not have the present addresses of a large number of men who served overseas with the Division," Warren stated, "and the only way to insure these men of getting information on the progress of the Association and a copy of the Division History is by contacting us."

All copies of the Division History will be mailed direct from the publisher.

5th Armored Division Association

On September 11, 1946, the Fifth Armored Division Association was formally activated with appropriate ceremony in Washington, D. C. Major General Lunsford E. Oliver, wartime Division Commander, presided and the affair was attended by a dozen former members of the Division, as well as by General Devers and General Haislip. The date of September 11th was set since this commemorated the first entry of Division troops into Germany in 1944.

At the initial meeting General Oliver was elected President of the Association and Lieutenant Colonel Ressegieu appointed Acting Secretary. Former members of the Division are urged to supply home addresses and information about themselves to the following address:

Lt. Colonel F. E. Ressegieu
Research & Development Division, WDGS
The Pentagon, Washington 25, D. C.

At present the main function of the Association is to compile a roster of home addresses of as many former members of the Division as possible. At sometime in the future it is hoped to hold a meeting of representatives from different geographical areas, at which time a more permanent and elaborate organization can be created.

General Oliver recently received word that Combat Command R of the Division had been cited by the French Republic for its operations from the 14th to the 20th of September 1944 in the Wallendorf Area, Germany.

General Oliver also recently received a letter from Prince Felix of Luxembourg, who was escorted into his home city by the Fifth Armored Division. Prince Felix expressed considerable interest in the activation of the Division Association and expressed a desire to become an honorary member.

* * *

9th Armored Division Association

ACTING SECRETARY, Captain Louis Gelling, of the Ninth Armored Division Association requests that former company and battalion commanders of units in the division contact him. He is particularly anxious to obtain all available rosters of former division units. All correspondence should be addressed to Captain Gelling at: Headquarters The Armored School, Fort Knox, Kentucky.

Former members of the Ninth Armored Division should also contact Captain Gelling if they are interested in joining the association.

11th Armored Division Association

THE Eleventh Armored Division Association will hold its first National Convention next summer in Chicago. The date of the meeting has been set for August 14, 15 and 16 so that members will reunite on the fifth Anniversary of the activation of the Division in Camp Polk, La. William Lipp, former Division QM, is making an extensive search in Chicago to find the hotel best equipped to handle the Convention.

Interest in the Association is growing throughout the country, according to letters now reaching the National headquarters at 1719 K Street, N.W., Washington 6, D. C. Many of our members have expressed a keen interest and willingness to organize local chapters of the Association in towns where Division membership is strong.

Charles D. Starrett, 490 AFA Bn. of Euclid, Ohio, has offered to help form a chapter in his area. We know we can count on Bernard Schwarts of New York City and Isaac Kramer of the MPs is lining up Thunderbolt men in Boston. John Janecek of Lincoln, Neb., sent up a list of all Band members and he states that members of the Division Band are keeping in close touch with each other. In a roundup of Thunderbolt men in the town of Irwin, Pa., 12 men's names were found, who served with the Eleventh.

From such groups as these, the Association is seeking to accomplish the purpose set forth in the Constitution drawn up in Gmunden, Austria, just before the Division was disbanded. This Constitution states that the Association was formed to "foster fellowship and good will amongst members of the Division . . . to provide mutual aid and assistance and to promote the general welfare of its members."

Details of how this can be accomplished will be discussed at business meetings to be held next summer. At the same time, the agenda will include the election of officers and the submission of a permanent constitution and by-laws for the Association.

In the meantime, news of the Division will continue to appear in this column. Here are some of the latest news items:

Albert H. Buschmann, Div. HQ. of New York, just became the father of a baby girl. Don Casanova, of the Band, is singing his "Rum and Coca-Colas" in New York. He has plans that may take him on tour as far as Puerto Rico. Major Michael J. L. Greene, 41 Cav. Rcn. Sq., writes from Germany that he has met the following 11th A.D. officers, all in the U. S. Constabulary, now policing Germany—Col. Charles H. Reed, Capt. Harold Mullins, Lt. Col. Joe Ahee, Major Ralph Gray, Col. Leo B. Conner, Lt. Col. Ernest Brooch and Lt. Col. Palmer McGrew. He also saw Major Hill Blaloch and Lt. Col. George Pickett of the 1st Inf. Div.

Lt. Col. Joy R. Bogue, who G-2'd the 11th through Louisiana maneuvers, and was also Chief of Staff of amphibious operations in the Pacific, is now instructing in the Intelligence Course at Command and Staff College.

Roy Stringfellow and John Whitaker of the Division Infantry and Robert F. Jenkins of the Division Signal Company are now working in Shreveport, La.

Mrs. Elizabeth McWilliams of Darlington, Wisconsin, has asked to be put in touch with any of the buddies of her son, Kenneth P. McWilliams, who was killed in the Ardennes campaign.

The rapid growth of the Association has been especially marked during the last month. Yet membership from some of the units of the Division is noticeably lacking. This is due largely to the inability of the Association to obtain rosters of their veterans. Information is being sought especially of the names and whereabouts of former members of the 492 AFA Bn. and all companies except "A" of the 133d Ord. Maintenance Bn. We would like to have rosters of both.

We want to thank those of you who sent in your names in response to our request in the newspapers. We received over one hundred and fifty replies and we wish we could thank all of you by name in this column, but space does not permit it.

* * *

12th Armored Division Association

PROOFS of the 12th Armored Division Combat History, priced at $5.00, are expected off the presses in the near future. The book can be ordered from: 12th Armored Division Association, P.O. Box 950, Baton Rouge, Louisiana.

Temporary address of all communications pertaining to the Division Association is: J. Edward Obey, 419 West 38th Street, New York 18, New York.

Pat Harness, formerly of the 56th AI Battalion, is publishing a monthly edition of the *Hellcat News*, subscription to which is $1.00 a year. Subscriptions can be sent to Mr. Harness at: 2737 South Veitch Street, Arlington, Virginia.

The Executive Council of the Association made tentative plans at a meeting in June at Harrisburg, Pennsylvania, to hold the first convention of the Association somewhere in the East in September, 1947, which will be the fifth anniversary date of the activation of the division.

Those men who joined the Association in Heidenheim, Germany, have a valid membership until the end of 1946. Those who joined overseas and who have also purchased a membership recently are members in good standing until December 31, 1947. Those who have not renewed their membership are urged to send $1.00 to the Association at: P.O. Box 950, Baton Rouge, Louisiana.

14th Armored Division Association

FORMER members of the 14th Armored (Liberator) Division are requested to write Lieutenant Colonel J. C. Lambert, Adjutant General's School, Fort Oglethorpe, Georgia, for information about the formation of a 14th Armored Division Association.

Innumerable inquiries concerning such an organization have been received, according to Colonel Lambert. The organization has the backing of both Brigadier General Albert C. Smith, ex-major general and wartime division commander, and General Jacob L. Devers, former Sixth Army Group commander and present commander of the Army Ground Forces.

The association, according to Colonel Lambert, will be a nonprofit one and will not pledge support to any political party, religious group, or other organization of veterans. Its purpose will be to foster and preserve the comradeship and *esprit* that existed among its members during the training and combat life of the division.

The 14th Armored Division trained at Camp Chaffee, Arkansas, and Camp Campbell, Kentucky. It is credited with liberating 200,000 allied prisoners of war and 250,000 displaced persons. More than 500 of its members were killed in action and 3,000 wounded. The division was inactivated at Camp Patrick Henry, Virginia, during September, 1945.

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Letters to the Editor

VETERANS' ASSOCIATION 6TH U. S. CAVALRY

Detroit 13, Michigan
October 31, 1946.

Colonel Edwin M. Sumner, Editor,

ARMORED CAVALRY JOURNAL,
1719 K Street, N. W.,
Washington 6, D. C.

Dear Sir:

Received your letter of October 25th.**

***Regarding the Veterans' Association 6th U.S. Cavalry, early in September 1946 a letter was received from Colonel T. J. Marnane in reference to the policy of the Commanding General, Fifth Army, to assist us in forming a 6th Cavalry Division Association. Needless to say, we appreciate his attitude and offer of assistance very much and we may make use of his offer.

One correction on his letter, however—we are not, and do not intend to become a division organization as that would be a misnomer. The 6th Cavalry was a regiment until January 1, 1944, at which time it was reorganized on the Group setup, therefore we will maintain our present name and title of the 6th U. S. Cavalry Veterans' Association.

One matter the ARMORED CAVALRY JOURNAL may be able to help us on, is the absorption of the 6th Cavalry Group Association, which was organized shortly after the termination of the war. It is the opinion of our Commandant that, that organization was set up because the fellows did not realize that the Veterans' Association—6th U. S. Cavalry was in existence, and had been for many years.

At present we are planning a Cavalry Round-up, or reunion for the association in Chattanooga, Tennessee, which we would like to hold early next summer, therefore if the JOURNAL can lend any assistance in the matter it will be appreciated, at least in boosting our membership.

W. R. WAGNER,
Adjutant.

FIFTH UNITED STATES CAVALRY VETERANS' ASSOCIATION

Newcastle, Pa.

Colonel Edwin M. Sumner, Editor,

ARMORED CAVALRY JOURNAL,
1719 K Street, N. W.,
Washington 6, D. C.

Dear Colonel Sumner:

Your letter of October 29, received and its contents noted with pleasure. You request a short history of our association, but as all the historical records are in the custody of our Historian, Comrade John H. Hackett, in Savannah, Georgia, I am unable to give you any data about the regiment. But, I will try and explain our aims and objectives in a few brief remarks.

First, to inculcate the true principles of patriotism and loyalty to the United States Flag and Constitution, to cherish the true traditions of the regiment in which we had the honor to serve, to show our appreciation of the service of the officers and men who have served in time of peace or war of yesteryear. Our aim is to cultivate the true principles of fraternal comradeship, to maintain open hearts and sympathy to all within our circle and to render aid and comfort to those who are in need of assistance and to promote a feeling of true comradeship to any member of the grand old Fifth U. S. Cavalry, wherever he may be.

This preamble is very prominent at our annual meeting. Every year we who attend meet some of the boys who served in the regiment in Puerto Rico and the Philippines, and it surely brings back memories. I have met any number of comrades whom I had not seen for 44 years at these annual meetings.

Our annual meetings in the past have been well attended. Members have come from every state in the union, Cuba, Puerto Rico, and other places too numerous to mention.

I send very best wishes to you and your association, and I am in,

Comradeship,

A. B. HAID,
Commander.

What Would You Do?

by Colonel Hamilton H. Howze[*]

SITUATION (See Sketch)

You are commanding a cavalry troop (proposed organization)* of a Corps Cavalry Squadron. Your troop is engaged in a pursuit, and during this day has been delayed by successive small enemy detachments. In your evaluation of the terrain, you estimate that the strongest defensive position along your entire route is the ridge ABC.

Your leading platoon split at the road fork at Y and continued forward. When the leading elements were at K and N, the left column received AT fire from Hill A and lost an armored car which is now burning briskly, as may be seen from the sketch. The remaining elements on the left fell back hastily to L, while the right took cover in the woods at M, where they could see the terrain fairly well, but no sign of enemy.

The head of the troop column is now at Q. An artillery round has just landed 200 yards left of Q. A patrol dispatched by you to P received a near miss from a shell that came in flat and hard and exploded—seeming to come from either Hill B or Hill C.

The Squadron Commander now appears at Q and accompanies you to F where you both agree that Hills E, F, and B are traversable by tanks, but A and C are tank-proof.

The Squadron Commander now says to you, "I have brought a platoon of light tanks along; they are at the tail of your column, and attached to you. You must get past this ridge and proceed along your route with the minimum delay. Your forward observer here can get the fire of all six assault guns. It is now noon. Now tell me what you are going to do."

REQUIREMENT:

Tell him. What is your plan?

***PROPOSED TROOP (Corps Cavalry)**

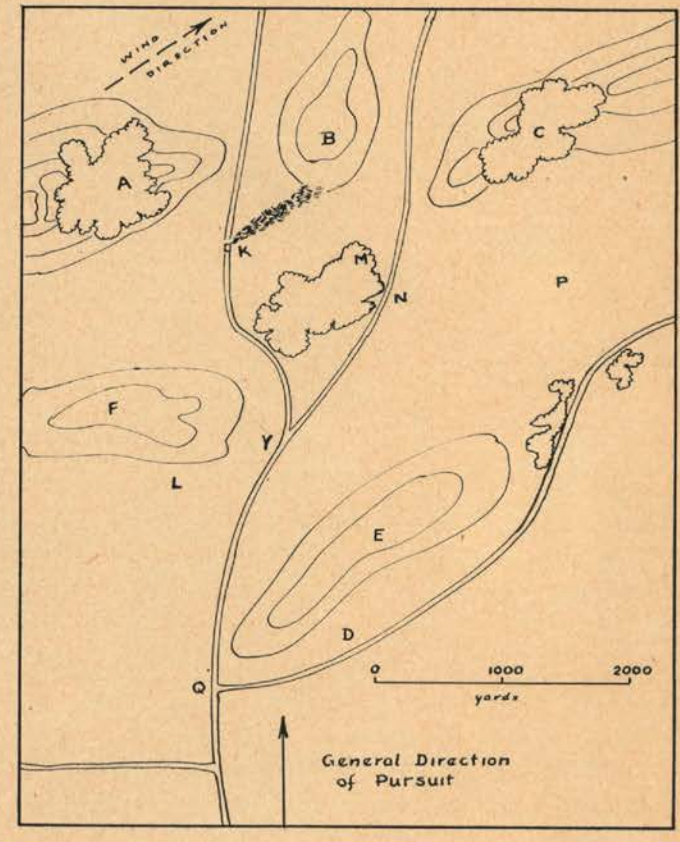
Troop Hq and Three Platoons

PROPOSED PLATOON

Two Scout cars, each of two one-quarter tons and one light tank.

Rifle Section. Two personnel carriers carrying a total of one officer and 21 riflemen besides drivers.

Support Weapon Squad. Two one-quarter tons carrying one 81mm mortar, ammunition and crew.



SOLUTION

My plan as the Troop Commander. (See sketch.)

1. I know now about as much of the enemy situation as I can reasonably expect to get without using up an inordinately great amount of additional time. I know that the enemy intends to defend both passes (on either side of B). Which he holds the strongest, or where his specific positions are, I do not know. I decide then to attack the pass where the terrain will best facilitate attack.

2. The remainder of the troop plus the attached tanks will assemble under cover just short of F, and I assemble the platoon leaders somewhere on F where I can issue them their orders. The leading platoon at this time will remain in its original position.

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[*] Director of Instruction at Cavalry School.

3. I will instruct the forward observer as follows: "Arrange to have your guns register in on concentrations 1, 2, 3, 4, and 5, as I indicate here on your map. Report back to me within one-half hour"—and send him on his job.

4. I will instruct the platoon leaders: "We will attack to gain passage through the pass between A and B. We will not bother to reduce the pass between B and C. This plan will require us to reduce the enemy positions on A and B. The second and third platoons will attack abreast, as indicated, to take the First Objective, supported by fire by the tank platoon on F. After it is taken, the second platoon will remain in position and support the attack on the Second Objective. That attack will be made by the third platoon attacking as indicated from A, while the light tank platoon will attack directly from F to B following the general route shown. On taking the Second Objective, that area will be consolidated by the troops on it and further orders will be issued at that time.

5. "Now as to details. My plan for the progress of the attack I have divided into phases.

"Phase 1. Second and third platoons cross line of departure, attack First Objective. Light tanks from F shell entire area of First Objective, with particular attention to suspected enemy positions. Artillery, fire concentrations 1 and 2 for ten minutes, simultaneously; then shift to slow fire on 3 and 4, prepared to return to 1 and 2 on my order.

"Phase 2. When attacking troops reach line R-R, tanks will fire on First Objective above and beyond the line S-S, until ordered to stop.

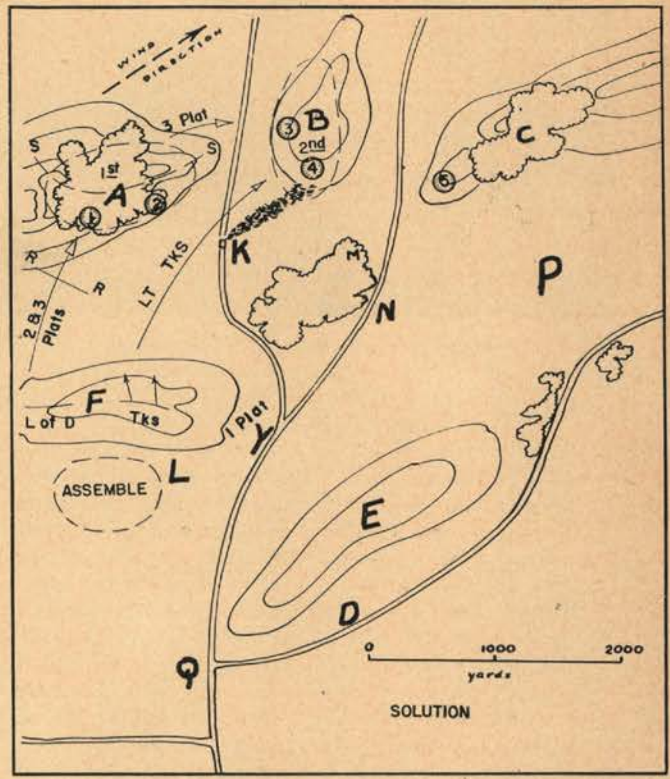
"Phase 3. Second platoon on First Objective occupies that position and places fire on Second Objective. It will lift that fire when endangering our own attacking elements or upon my order, whichever occurs sooner. Third platoon from First Objective as indicated, will attack Second Objective in conjunction with light tank platoon. Artillery will fire concentrations 3 and 4 until ordered lifted by me or by the F. O. Tanks will attack from hill at F along route as indicated and in conjunction with third platoon will occupy Second Objective.

"Phase 4. Troops on Second Objective will prepare to resist counterattack which, however, I do not expect. Do not dig in but be prepared for further movement in the general direction of pursuit. In this phase, the artillery will fire slow fire on concentration 5 unless called for for more pressing missions. The first platoon, when Second Objective is taken, will form on the road prepared for immediate pursuit to the north.

"Each of the above phases will be ordered by me.

6. "I will accompany the attack of the second and third platoons. The second platoon will be on the right. Platoons will dismount their riflemen prior to crossing the line of departure. Put your quarter-ton crews right with your rifles. Have one light tank follow each rifle squad, attached to it, to be called up to render close fire support as necessary. Put your mortars under cover behind F and register in on the reverse slope of hill A. Let them fire at a slow rate throughout our attack. Be sure you are capable of stopping their fire.

7. "It is now 1300 hours. Your platoons are assembled. Issue your orders carefully. We will attack at 1400 hours."



SOLUTION

* * * *

At the same time that the African wings wheeled inward on the disorganized Roman center, Hastrubbal appeared on the Roman rear flank thus closing off all hope of retreat or escape. Thus, with this third element, Cannae became the perfect battle, a battle of annihilation. The Romans fought with the utmost bravery and acquitted themselves with honor. Their lines grew shorter. They faced outward to meet the attacks of the enemy, but the pincers closed in on them pitilessly and they were crushed. The maniples fought independently and were cut off and destroyed piecemeal. Some groups managed to cut their way out. When the Carthaginians were themselves exhausted with the massacre, they took the remaining 3,000 Romans prisoners.—EDWARD BARKLEY WILCOX, *Cannae, the Perfect Battle.*

OTHER BRANCHES

Major General Robert T. Frederick

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Merry Christmas and a Happy New Year to Other Branches from the ARMORED CAVALRY JOURNAL

"Never before in the history of arms have the requirements of warfare demanded the cooperation, coordination and mutual understanding that today's weapons and methods make necessary. The increased tempo of warfare and the greater power of weapons impose upon all soldiers the obligation to seriously endeavor to know the capabilities, limitations and problems of all branches of the armed forces. The complex organization, the intricate equipment and the high degree of specialization of a modern army preclude any man becoming an expert in all its fields. But if each in his own field is to give the greatest service, and to receive the maximum support and assistance, he must know what is expected of him and what he may expect from others. The closer we can come to thinking in terms of the whole team rather than the elements of it, the more smoothly and efficiently will the team perform when the occasion to use it arises.

"If the Armored Cavalry Journal, through its 'Other Branches' Section, stimulates a desire for knowledge and understanding of the branches other than one's own, it will perform a real and commendable service."

Robert T Frederick

Major General, U. S. Army,
Assistant Commandant, The Artillery School,
Officer In Charge of Seacoast Branch

COAST ARTILLERY CORPS

Seacoast Artillery

by Captain Richard P. Fullmer*

SEACOAST ARTILLERY is an effective defense of the coast. That coastal defenses are not everywhere begs the question. It has been clearly proven that wherever seacoast armament is emplaced, it is a strong deterrent to assault, even after the most intensive preparation.

Fortunately during the last conflict the seacoast defenses of the continental United States were not called on to actively engage the enemy, but in no way does this render these defenses outmoded or unnecessary. On the contrary, since these defenses represent the final barrier to any enemy water-borne landing, their importance and vitality must never be underestimated nor allowed to deteriorate.

The following examples effectively illustrate the contributions made by seacoast defenses in the destruction, detention or withdrawal of attacking naval forces.

In 1915 a combined Anglo-French Fleet tried to force the Dardanelles; Turkish seacoast defenses frustrated this effort and the Allied Armada suffered a decisive defeat. Naval forces generally regarded fortified areas with extreme caution subsequently, and in 1941, the mere existence of the harbor defenses of Manila and Pearl Harbor dissuaded the Japanese from direct assault. In 1942, Corregidor and its attached forts alone denied to the Japanese the use of captured Manila harbor facilities for five months.

The Japanese were surprised by the resistance offered at Wake Island, too. The meager Marine seacoast defenses there, consisting of six 5-inch guns, sank seven Japanese warships, including one cruiser, and damaged two more before being finally reduced and overwhelmed. Dieppe's seacoast defenses beat off a heavy Commando raid that had lost the element of surprise, and in six hours the Allied forces lost more than two-thirds of their ships and men.

The seacoast defenses of Tarawa, manned by Imperial Japanese Marines, ravaged and almost beaten flat by a murderous naval and aerial bombardment, took a cruel toll of our attacking forces. The Soviet seacoast defense of Sevastopol, besieged by land and denied all help, fought off frequent fierce, determined German assaults, and successfully repulsed the enemy for two months. The French coast artillerymen in Oran, Algeria, survived aerial and heavy naval attack. During the naval engagement, the British reported that the shore batteries were active and accurate up to 24,000 yards. In fact the major battery at Oran was never silenced. The stubborn defenses at Lorient, Saint Nazaire, Calais and Dunkirk, interfered seriously with Allied supply and sharply reduced the speed and security of the Allied advances. As these examples demonstrate, assault operations against fortified areas have always been costly.

Consider, especially, the role and value of Corregidor. In an effort to speed up the Bataan campaign, the Japanese began a series of amphibious operations at the southern tip of the Bataan peninsula. The intention was to place Japanese troops behind the embattled Americans on the peninsula, cut off their retreat, and so force a quick end to the campaign. The first Japanese landing was attempted within the range of the seacoast armament on Corregidor. The old, obsolete 12-inch mortars of the seacoast artillery smashed that amphibious attack completely. No attacks were ever launched within seacoast armament range again. From January 2, when the Japanese took Cavite just across the bay, until May 5, 1942, Corregidor was under constant aerial and artillery bombardment. One by one the smaller, unprotected, rapid-fire batteries were knocked out but the turreted and casemated large-caliber guns continued firing to the very end. It is a source of endless pride to the Coast Artillery Corps that Fort Drum's 14-inch turret battery fired its last defiant round at the Japanese only five minutes before the final surrender by General Jonathan Wainwright. This heroic resistance of Corregidor was an inspiration to the Nation.

Clearly, then, the first protection of Manila and the last resort of American troops against Japanese aggression was the seacoast artillery of the Harbor Defenses of Manila and Subic Bay.

At home, alerted seacoast defenses protected our harbors and anchorages from attack. A German submarine slipped into the harbor at Scapa Flow and torpedoed a British cruiser early in the war. Seacoast defenses on both coasts prevented this from happening to us.

Troops performed the usual seacoast mission—to deny important harbor or island facilities to the enemy. This mission, by itself, necessitates a technical and tactical organization that is highly specialized and extremely flexible. It requires personnel thoroughly indoctrinated with the tactical concepts of several combat arms, highly skilled in technical artillery services, and expediently adaptable to all eventualities. In almost every instance of determined seacoast resistance to landing assault, the artilleryman has had to be a gunner, a combat engineer, a demolitions expert, an infantryman, and in many instances an expert in electrical, and highly intricate mechanical equipment.

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*Coast Artillery Corps.

A modern seacoast artillery battery is a complex unit. The combined efforts of many men are required to fire one salvo from a modern coast artillery 16-inch battery at a naval target. Some men operate or serve the pieces; others are assigned many different important duties—operation of the radar, computation of firing data, maintenance of communications, running the power plants, observation of the target and of firing, and technical maintenance of delicate equipment. Well trained crews can deliver two accurately aimed one-ton projectiles every sixty seconds; at this rate, a 16-inch battery can fire with pin-point precision twelve tons of high explosive projectiles every five minutes. Behind this firing, the complex fire control structure contains a highly skilled radar section which locates and tracks targets under any conditions of visibility and furnishes information on target location constantly to the computing section. The computing section operates an electrical data computer which converts the radar information on the present location of the target into future azimuth and elevation settings, *i.e.*, the direction and distance of the target, for the guns. These settings are electrically transmitted to the gun pointer and the elevation setter of each gun. In the majority of cases, this equipment and personnel are well protected in deep, strong, reinforced concrete emplacements.

In this impregnable self-sufficiency is rooted the tough fiber of seacoast artillery resistance to assault. All mobile seacoast batteries attempt to approximate the indomitable indestructibility of these fixed installations by digging in and preparing for the contingency of final assault.

Seacoast troops man artillery that includes 16-inch rifles, 8-inch and 6-inch guns (most of which are at present casemated), 155mm Long Toms and 90mm dual purpose guns, as well as 40mm automatic weapons. In the 90mm and 40mm classes, the seacoast troops fire antiaircraft missions in addition to their normal seaward mission.

In this respect it may be noted that, contrary to public opinion, our present seacoast matériel is not obsolete but is perfectly capable of destroying any of the present water-borne vessels of modern warfare. However, it is visualized that in the not too distant future practically all of this matériel will be replaced by guided missiles.

Coast Artillery troops also operate underwater mine defenses, including the Army Mine Planters. The submarine mines planted by the Coast Artillery are the largest and most intricate mines used by the armed forces. All of these mines are controlled electrically from shore and are a threat only to enemy vessels. When hostile vessels, surface or undersea craft, are detected in the mined areas, individual mines closest to the enemy may be set off deliberately by the shore control station, or the entire mine field may be energized so that the approach of a vessel to a mine detonates the mine.

All these normal operations of the seacoast troops, including the operation of seacoast searchlights, require long and intensive training. Added to them, however, is training for individual combat, for infantry combat, for light field engineering and field fortification, for field orientation and survey work, for demolition work, and for basic field artillery firing. In the latest war, seacoast artillerymen were hurriedly transferred into other services and arms and rapidly trained to perform the duties of their new assignments with a minimum of difficulty. Whole units were converted overnight into field artillery units, infantry replacement units, port battalions, and quartermaster units without extensive instruction. The speed with which this transformation was accomplished proved the adaptability of the seacoast soldier and the validity of this hard-won fundamental training. Coast Artillery units participated in landing operations as shore parties, infantry troops, artillery troops, military police and performed a host of other duties, sometimes with only a briefing on board the assault vessels before disembarking.

The knowledges and skills of the seacoast artillery troops were used in this latest war in so many diverse ways that the identification of seacoast troops was almost lost in the constant turmoil and stress of the struggle.

In the near future, the advent of radically new weapons will provide the attacker with means for swifter, more diversified and powerful thrusts as well as improving the accuracy and strength of the defender. Therefore the coast defender of tomorrow must be capable of rapid movement and concentration of power against any threatened point on American coasts. The Coast Artilleryman's background of proven adaptability, versatility and fundamental understanding of combat principles has prepared him well for solving the ever changing problems of coastal defense. The tested flexibility of seacoast organization and the demonstrated resilience of the seacoast soldier are good foundations on which to build now a force capable of quickly meeting and absorbing the enemy's hardest blows and so helping win the needed time for our national mobilization and organization for the counterblow. Intensive training, constant drill, endless repetition of defense exercises, minute scrutiny of methods and procedures, target practices, field maneuvers, and continuous research for the development of new and better weapons, all these will drive home to each seacoast artilleryman his ultimate purpose, to move, stand and fight.

For the present he will man the conventional seacoast artillery but with the development of new weapons, rest assured that new defenses will replace the old and the seacoast artilleryman will be ever vigilant to insure that at all times he is prepared to do his part in the defense of our country at home and on our island outposts.

CARDED

Veterinary Activities in World War II

by Lieutenant Colonel William E. Jennings, V. C.*

When World War II ended in August, 1945, there were 41,600 horses and mules in the Army, of which more than 17,000 were in overseas theaters. The peak animal strength of 60,170 during the war was reached, however, on December 31, 1943. Colonel Jennings gives a thorough picture of what these animals did and how they were cared for during the war.

ARMY VETERINARIANS so closely guarded the health of animals in World War II that there was not a single epizootic among the thousands of horses, mules, war dogs and pigeons engaged in military operations. That accomplishment, through the application of modern Veterinary Medicine, including an effective program of immunization, stands unparalleled in the history of war.

And to that may be added the fact that, even if there had been a serious outbreak of disease in military animals, the veterinary service of the United States Army was effectively organized to handle it. Due in large part to the experience gained in the first world war and to research and development in the years that followed, the United States Army had organized and developed one of the best systems of veterinary service for animal care in military history, prior to the beginning of World War II.

By act of Congress, the Veterinary Corps of the United States Army was organized on June 3, 1916. In connection with the care of public animals, the veterinary service has a fourfold responsibility. First, it is charged with inspecting all animals offered for sale to the Army, to determine their physical fitness and freedom from communicable diseases. Secondly, it functions to protect the health and preserve the efficiency of those in service. Thirdly, it is also charged with the veterinary technical supervision of the Quartermaster Remount Breeding Program. Finally, when animals become unfit for military duty, yet are still serviceable for agricultural or commercial purposes, they are sold to civilians but provided only that they are certified by a veterinary officer to be free from communicable disease.

This is an important responsibility in connection with the prevention of the spread of communicable diseases among civilian-owned animals. Previous to World War I, excess Army animals were sold without regard to their state of health. As a result, such diseases as glanders, which was rare in the United States prior to that time, was spread to every county and city east of the Mississippi. It was not until the close of the century that this highly contagious disease of equines was brought under control. In the meantime, glanders took a toll from farmers and owners of horses calculated in the hundreds of millions of dollars.

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*Chief, Animal Branch, Veterinary Division, Surgeon General's Office.

To that costly lesson in animal management, and animal disease control, were added a number of other lessons, all learned in an equally costly and in an equally unforgettable way—all prologuizing the eventual organization of a competent veterinary service. In the Spanish-American War, for example, the purchase of unfit animals was so notorious and the loss of animals at the volunteer and regular army camps was so appalling that newspapers blazoned those facts alongside shocking reports of the death of troops from filth-borne disease.

During the first world war the United States Army utilized approximately 572,000 horses and mules, of which over 191,000 were overseas. It is estimated that the combined animal strength of the Allies in that war was 750,000.

At the beginning of the period of limited emergency (September 8, 1939), the animal strength of the Army was 23,283. From that date until July 1, 1940, the animal strength remained at about the same level. On July 1, 1940, the Army embarked on a program of rapid expansion and The Quartermaster General began to procure, immediately, relatively large numbers of horses and mules. During the recent war, on December 31, 1943, the animal strength reached its peak—60,170 animals. With cessation of hostilities in August 1945, the horse and mule strength of the entire Army was 41,600, of which more than 17,000 were in overseas theaters. The above figures are for the United States Army only, and do not include many thousands belonging to Allied Armies, under American control and for which the United States Army Veterinary Corps rendered service.

On July 1, 1940, when The Quartermaster General began to procure relatively large numbers of horses and mules, construction of new veterinary hospitals and additions to existing hospitals at posts, camps, and stations in the United States, was initiated at once. The Veterinary Division, Surgeon General's Office, had anticipated that need and already had detailed plans for a group of hospital units from which complete hospitals could be constructed to accommodate the number of sick and injured animals at posts, camps, and stations. The individual units consisted of medical clinics, surgical clinics, 30-stall ward buildings, 20-stall contagious ward buildings, dispensaries, administration buildings, barracks, dipping vats and corrals. These plans proved of great value, particularly in view of the indefinite premise upon which the wartime animal strength was projected.

Pack animals were indispensable to troops fighting in Burma. A pack train is shown here carrying food, ammunition, weapons and other supplies.

Signal Corps Photo

Hospital facilities were established on a basis of 3.5 per cent of the animal strength of a command, that being the rate which experience had indicated was proper for the zone of the interior as compared with a rate for theaters of operation of from five to 12 per cent, or even higher, depending upon the extent and type of combat activities.

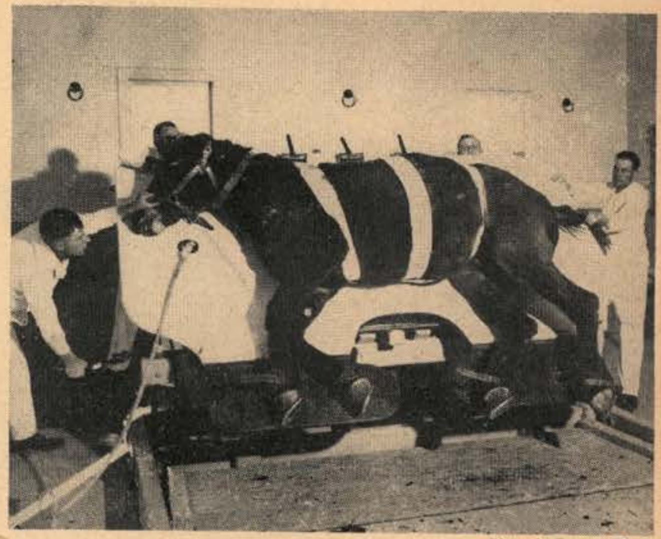
With the advent of motorization and mechanization, methods of evacuating animal casualties changed. The animal-drawn ambulance of World War I was discarded and the leadline, another development of that war, was used less and less for leading casualties back to treatment stations. Mobile units and detachments serving with tactical commands were not charged with care of unserviceable animals. Temporarily incapacitated animals were evacuated through a chain of specially equipped units for further treatment and hospitalization. Permanently unserviceable animals and those which were uneconomical to salvage were destroyed immediately. Provisions were also made for the quarantine and disposition of all captured and stray animals. To insure that diseases would not be spread by such animals, all were placed in quarantine for 21 days, immediately upon receipt.

In this diagrammatic chain of evacuation, veterinary detachments, attached to each regiment and to smaller independent mounted organizations, operated dispensaries or aid stations where disabled animals were collected, treated, sorted, and their disposition determined. To the rear, still in divisional area, were veterinary companies or veterinary troops which served as connecting links between the front-line installations and the Veterinary Evacuation and Veterinary Convalescent Hospitals located in the rear of the combat zone. In the zone of communications and the zone of the interior, veterinary station hospitals of 25- to 150-stall capacity provided the necessary hospitalization facilities.

In the equipment initially provided for the Veterinary Company (Separate), the motorized evacuation elements consisted of 2½-ton, 6 x 6 trucks with stock-rack bodies. Later, when cavalry porté units were organized and equipped with prime-movers and semi-trailers for transporting horses, the Veterinary Company's 6 x 6 trucks were exchanged for the cavalry's type of transportation in the interest of uniformity. Under the simulated combat conditions of the Louisiana Maneuvers, in 1940, the evacuation trailers were found to be inferior to the 6 x 6 trucks, formerly used by the veterinary companies, for cross-country use. World War II experiences further proved the worth of the 2½-ton truck with stock-rack body in getting over rough ground to evacuate sick and injured animals.

Added war experience proved and projected plans for the global war clearly indicated that animals were never to be used in large numbers for combat operations. Therefore, two large Veterinary Station Hospitals (23d and 24th), and one Veterinary General Hospital (30th), which had been organized and trained in the United States, would not be needed or utilized overseas. Accordingly, all three were inactivated and their personnel assigned to veterinary evacuation hospitals and veterinary teams which proved to be of inestimable value in rendering the necessary veterinary care for sick and injured animals. These veterinary teams were organized by War Department approved Tables of Organization, as follows: a motorized evacuation detachment of 1 officer and 10 enlisted men; one of 3 enlisted men only; a hospital detachment of 1 officer and 19 men, capable of hospitalizing 30 animals; a hospital detachment of 2 officers and 35 men, capable of hospitalizing 75 animals; an animal service detachment of 1 officer and 4 men for attachment to small mounted units, such as pack troops; and a headquarters animal service detachment of 1 officer and 2 men, to supervise three or more animal service detachments. These units performed the same functions as their larger counterparts and all of them were self-contained to render veterinary service.

In addition to the valuable service rendered by veterinary units in the care and treatment of the sick and injured animals, the United States Army Veterinary Service performed many other outstanding services in connection with animals not only for the United States Army but also for the Allies. In January 1944 the British Army sent a mission to the United States for the purpose of purchasing 2,200 mules for use by British forces. The United States Army was responsible for the care and movement of these animals to the New York Port of Embarkation. Further, as British Army veterinary personnel were not available to accompany these animals onward from New York Port of Embarkation, United States Army veterinary officers and enlisted men were assigned to each ship and charged with the professional care of the animals while en route to their destination. Only one of the 2,200 mules was lost en route to their destination—Calcutta, India. In recognition of the efficient manner in which this group of animals was assembled, cared for and shipped to their destination and the splendid condition of these animals on arrival in India, the Director of the British Army Remount Service dispatched an official communication to the Chief of Staff, U. S. Army, expressing his high regard for the invaluable assistance rendered in connection with this project.



Signal Corps Photo

With a mule safely strapped on an operating table at the 23d Veterinary Station Hospital at Fort Bliss, the table is then lowered to a horizontal position.

As a result of the long war with Japan, the Chinese Army had suffered many reverses and defeats. The veterinary service, too, had suffered severely and the animals were in a deplorable condition. To assist the veterinary service of the Chinese Army in caring for the many thousands of animals so vitally needed for the transportation of supplies to units of the Chinese Army, over 400 United States Army veterinary officers and enlisted men were assigned, in a liaison capacity, to the various units of the Chinese Army. This liaison veterinary personnel worked side-by-side with their Chinese colleagues, establishing veterinary schools, horseshoeing schools, and schools for instruction in animal management and packing. In addition to this liaison veterinary personnel, the following United States Army veterinary units were attached to the Chinese Army to assist the Chinese veterinary service in rendering veterinary care, evacuation, and treatment for all sick and injured animals: four veterinary companies (Separate), two veterinary evacuation hospitals, 28 veterinary animal service detachments. As a result, countless numbers of animals were saved which would otherwise have been lost; sick and injured animals were returned to duty, promptly; and the veterinary service of that Army was revitalized to a point not expected by even the most optimistic.

Many other equally outstanding services rendered by the United States Army veterinary service during the recent war could be mentioned. The work done by U. S. Army Veterinary Corps in Iceland in the control of diseases which were devastating the animal population in that country was of the very highest order. In the Military Governments established in Germany and Japan, and the governments established in countries which had been occupied by the enemy, United States Army veterinary officers did outstanding work in the preventing and controlling of animal diseases which were depleting very rapidly the food supply in these countries, where acute shortage of foods of animal origin already existed. Vigorous effort against such devastating diseases as foot and mouth disease, rinderpest, surra, hog cholera, and others, through vaccination, quarantine and isolation, placed these diseases under control and prevented their further spread.

As a parallel of the service rendered by the United States Army Veterinary Service to the Chinese Army may be mentioned that furnished to the Italian Army after its defeat. The veterinary service of that army was completely disorganized when the Italians surrendered. There were thousands of valuable animals, all well-seasoned by combat, which were absolutely essential to our operations against the German Army in the rugged, mountainous terrain of Northern Italy. The Italian veterinary units were reorganized and equipped and, under United States Army veterinary supervision and direction, proved to be of most vital importance in the successful completion of that campaign.

In the transportation of animals by rail, water and air, the United States Army veterinary service played an important role and, ofttimes, the leading part. During the recent war, several thousands of United States Army animals were transported from the United States to overseas commands without a single outbreak of communicable disease occurring and with the exceedingly low mortality rate of less than 1 per cent as a result of disease and injury. Further, all animals landed at ports of debarkation in such excellent condition that theater commanders praised the splendid manner in which animals were handled while being transported overseas. Indeed, the exclusion of disease, the maintenance of a low mortality rate, and the delivery of animals at their destination in such excellent condition are all remarkable accomplishments when it is considered that animals were transported great distances, frequently being aboard ships for periods ranging from 45 to 60 or more days with much of the time spent in tropical climates.

Over 9,000 animals were moved by air from Burma to China to stem the advance of the Japanese forces on our vital air bases in China. From these bases, the U. S. Army 14th Air Force (Flying Tigers), late in the war assisted by the U. S. Army 10th Air Force which had done so superbly in assisting the ground forces in retaking Burma, sent almost daily missions to disrupt and destroy the Japanese communications, depots and transportation of supplies in that part of China occupied by the enemy and in the China Sea and those islands adjacent thereto. In the movement of these 9,000 animals, and such a movement is without precedent, not one animal was lost or incapacitated. Planes of the C-47 type were used exclusively—four animals and their equipment to each plane. Altitudes from 14,000 to 18,000 feet and in some instances 20,000 feet were necessary to clear the jagged, snow-covered peaks of the Himalayas. Four to 10 hours, depending upon the destination in China, were required to complete each flight. The U. S. Army Veterinary Service was responsible for all loading and unloading operations. The enviable record established in this movement of animals will remain a challenge for years to come.

A review of the records of 43 of the largest rail shipments of U. S. Army animals made in the United States during World War II indicated that in moving 20,000 animals in shipments averaging 465 animals each and requiring from 3 to 10 days with an average of 5½ days in transit, only 93 animals were lost. Of this number, 51 died from exhaustion and overexposure of one 8-day shipment of 370 mules in open stock cars under unusually severe weather conditions. They had been loaded originally during a freezing rain and experienced unusually cold weather throughout the entire trip and were not unloaded for feed or water during the last 32 hours of the journey.

In this instance, the stock cars had not been protected with tar paper, as is customary when shipments are made in severe weather. In another shipment of 1,091 moved from a very cold to a very warm station under rather severe conditions, 31 animals died as a result of equine influenza, complicated by overexposure and exhaustion. The above two instances were the only ones made during the war where losses of any significance occurred incident to shipping. In all shipments only two animals died as a result of injuries received during shipment. The rail shipments of animals during World War II proved again conclusively that any deviation from the accepted, time-proven practices will lead invariably to unnecessary losses—not only from the mortality standpoint but also from the standpoint of loss of condition and animal effectiveness on arrival at destination.

The remarkably low incidence of disease among U. S. Army animals during the recent war can be attributed entirely to the established system of prevention and control of communicable diseases by quarantine, isolation and vaccination against the common highly fatal diseases affecting horses and mules such as anthrax, tetanus, equine encephalomyelitis (sleeping sickness). One needs but to review the results of the widespread epizootic of equine encephalomyelitis in the United States in the summer of 1938 to be convinced of the proven value and efficacy of the U. S. Army vaccination program against this disease. Since 1939 when this program was inaugurated, only one U. S. Army animal has died as a result of this disease, which is the most serious disease affecting horses and mules in this country. Many civilian-owned animals in areas adjacent to U. S. Army posts have been affected during the past seven years and the mortality rate among affected animals has been unusually high.

The routine administration of tetanus toxoid which was initiated as a routine measure in 1941 has eliminated tetanus from military animals. Immunization against anthrax prevented even a single occurrence of this disease in Army animals though many animals were used in overseas areas where anthrax was prevalent.

Glanders, the scourge of all former wars, did not appear due to the rigid program of testing and prevention used by the Army since 1918. Mange and other insect-borne skin diseases were held to a minimum.

It must be remembered that during World War II, U. S. Army animals and animals belonging to our Allies were used in tropical climates and in the Orient where diseases, unknown in this country, are ever prevalent. A striking example of such a disease is surra —a blood-borne (Trypanosome) disease which is rapidly transmitted by biting insects. This disease appeared among the animals engaged in the Burma campaign. In the rear of that zone of combat a U. S. Army veterinary laboratory was established to study this disease and to test those drugs which the veterinary service in those foreign countries had accepted as being efficacious in the treatment and prevention of this debilitating disease of equines.

The U. S. Army Veterinary Research Laboratory was established at the Quartermaster Remount Depot, Front Royal, Virginia, in 1939 to study the more common diseases affecting horses and mules. At this laboratory also the toxic affect on animals of several drugs and chemicals used in this country and foreign countries in the treatment and prevention of diseases of horses and mules, have been tested. Further, viruses of several diseases obtained from clinical cases in main, have been tested to determine whether or not those viruses will remain viable in animals and whether or not animals may be a reservoir of these human viruses. The importance of these studies cannot be overemphasized. At this laboratory several important scientific investigations have been made, the economic importance of which to the livestock industry in this country cannot be measured from the monetary standpoint. The work done in that laboratory has proven conclusively that equine periodic ophthalmia (moon blindness)—a disease of world-wide distribution and known to man from time immemorial—is caused, in part, at least, by a vitamin deficiency. Riboflavin-deficient diets tend to produce this disease. There may be additional nutritional factors involved but the addition of Riboflavin in the amount of 40 milligrams daily in the feed to an animal will prevent the occurrence of this disease. The causative agent of equine influenza—a virus—was first isolated at this laboratory. Studies of this virus are continuing.

Through the application of sound principles of animal management, the use of time-proven methods in the shipment of animals, the application of the principles of modern veterinary science and the investigation of all outbreaks of contagious diseases affecting animals, the record of the U. S. Army Veterinary Corps in World War II stands unprecedented. Much credit is due to the invaluable assistance rendered by those civilian veterinarians who, seeing service in the U. S. Army, were in no small way responsible for the splendid achievements of the veterinary service of the U. S. Army during this most recent and devastating of all wars known to man.

Signal Corps Photo

An American soldier of an evacuation hospital in China unloads a horse of the 22d Chinese Division as the division was flown over the "Hump" from Burma in 1944.

Air-Ground Cooperation

by Israel Horowitz

THE problem of coordinating the efforts of ground and air units against enemy forces is intimately connected with tactical and strategic considerations. This was true in the last war and will hold true even more in any future conflict.

Strategic bombing of cities and industrial centers, with its reduction of the enemy's industrial potential and will to resist, bear directly on the type of ground operations that yield the greatest results. The isolation of battle areas by the process of interdiction has often given ground troops freedom of action otherwise unobtainable. U. S. Army Air Forces action, in close consort with combat ground troops, sped the successful culmination of campaigns.

Often it is difficult to delineate sharply between air actions of different types. They overlap both operationally and functionally; many times a single air action is of importance strategically and tactically. The classic concept of "air support of ground operation" is practically obsolete. More accurately, the interacting teamwork that brings victory on the battlefield may be described as "air-ground cooperation."

The large-scale attack at St. Lo, begun on July 25, 1944, provided one of the most spectacular examples of this type of cooperation in World War II. On that day, tons of bombs and incendiaries saturated an area 3,000 feet by 7,000 feet south of St. Lo–Periers highway. The first phase of the attack lasted two and a half hours and utilized 1,500 Fortresses and Liberators, 400 mediums and 550 fighter-bombers. The effect on German troops was devastating, casualties and shock having reduced greatly their power to resist. Enemy communications were completely disrupted.

American ground commanders lost no time in following up their advantage. They found the 14th German Paratroop Regiment, which had been holding up the American advance south of St. Lo, hard hit and largely demoralized by the bombardment. American commanders were united in agreeing that the major obstacle to their advance after the barrage was not the negligible enemy resistance. Rather it was in the difficulty of moving motorized troops over the incredibly pocked and cratered terrain.

Lead tanks, spearheading the advance, were fitted with two-way, very-high frequency radio sets. This made possible instantaneous communication between forward ground elements and the fighter-bombers ranging the skies above them. To insure that no unreasonable requests for air action were transmitted, the foremost elements of the tank columns carried qualified pilots. These grounded airmen took charge of ground direction of aircraft and advised ground commanders on the best use of air support.

In the normal prosecution of a campaign, any ground unit commander may initiate a request for air support. The request then will work its way up through normal command echelons until it reaches a command post which includes an air support party. Upon receipt of the request, the air support officer and the commander of the ground unit with which he operates immediately consult as to its practicability. Reaching agreement, they immediately forward their recommendations to the air support control.

Responsible officers at the air support control consider the request with respect to its furtherance of the general tactical plan. Special emphasis is placed by these officers on conditions affecting the successful completion of the air action. Of utmost importance in their deliberations are the number of airplanes required, the number of airplanes available for use, weather conditions along the route and at the target, and the type of bombs and ammunition required.

Data necessary for a true appraisal of the mission must be incorporated in the original request. Such data includes information detailing the type of target, its exact location and the direction and speed of its movement, if any. The location of friendly troops with respect to the target should also be included as well as the estimated time limit for effectiveness of the desired raid.

If the request is approved, it is forwarded in attack order form directly to the airfield of the supporting unit for compliance. Depending upon its state of readiness to insure success of the attack, the operational unit at the airfield takes the necessary action. The decision of the air support control, whether favorable or unfavorable, is transmitted through channels back to the ground commander who originated the request. If unfavorable, this message details the reasons which make the requested mission impossible.

As soon as the airplanes return to the field the air unit commander evaluates the results of the mission. This Intelligence and all pertinent data are reported to the air support control where the attack order originated. In addition, the ground commander, through the same channels used to route the original request, reports the result of the mission as viewed from the ground and as affecting further ground operations. Thus, the air support control is provided with a rounded picture of the entire operation.

Since aircraft are more vulnerable and less easily replaced than artillery, only those targets not easily reached by artillery are normally assigned to supporting aviation. Air support cannot be guaranteed. It may be limited by weather, enemy action or mechanical failure.

The success of any combined air and ground operation is dependent primarily on accurate timing. Ground commanders must compute, with a high degree of accuracy, the time allowances for effective air action. Such computation, basically, includes time lapses for the transmittal of requests through channels, and for aircraft to leave the ground and reach the target area. Other conditions will vary with particular conditions.

To allow ground troops to take maximum advantage of air support and to protect them against casualties inflicted by their own aircraft, the last element of combat aviation may communicate with the ground. This communication may be either by flare or radio. The ground attack may be launched at the prearranged signal or at the expiration of a previously agreed upon time limit.

The types of missions used by tactical aviation in the support of ground troops resist all-inclusive cataloging. However, they may be said to fall into six general categories.

Combined reconnaissance bombing missions allow aircrew members the greatest latitude of action. The target is not usually detailed in advance. Rather it is developed and attacked at the initiative of the pilot.

Air attacks are conducted against enemy defensive organizations in the path of support ground forces when time does not permit the use of other attack methods. Such attacks, of particular value to mechanized and armored forces, add the fire power and moral effect of air action to ground operations, often essential to insure timely success.

Hostile ground units on the move toward a supported force are normally a remunerative bombing target. Air attacks on enemy reserves and reinforcements serve the purpose of blocking and delaying their movements, or effecting their destruction or demoralization.

Of major importance are attacks on approaching mechanized and antitank units before they gain contact with the supported forces. Often the destruction of the supply and maintenance elements of such enemy units can quickly render them impotent.

Attacks on hostile aviation serve the obvious purpose of achieving and maintaining control of the air. Supported ground forces are unable to operate with freedom unless hostile air attacks are reduced to a minimum.

In the case of operations in the support of parachute troops and other airborne units, the prime objective is to gain and hold air superiority over the contested terrain. Security must be provided for airborne troops while in transit and during landings, the periods when they are most vulnerable. Air attacks are aimed at enemy ground defenses at or near the objective until the goal of the supported unit has been attained. In addition to these targets, offensive air action is directed against enemy reserves or reinforcements that threaten the supported force.

Although no foolproof method exists which insures immunity to troops from bombardment by its own aviation, the observance of certain safeguards can keep such tragedies to a minimum. Rapid dissemination of intelligence is the most important single factor in this connection. Communication to the associated air support agency by the ground commander relative to any changes affecting the disposition of the troops in his command must be given immediate priority if such changes occur subsequent to a specific request for a support mission. Other safeguards are the thorough indoctrination and training of air and ground personnel in the visual identification of both enemy and friendly uniforms, matériel, planes, formations and signals.

Today new technical advances are being put to tactical use in increasing the sum of air-ground cooperation knowledge.

* * * *

Two companies of the 41st Infantry Battalion, a part of the Second Armored Division at Camp Hood, Texas, recently experienced something different from their predecessors in armored infantry basic training. Under a six-day program these companies went through a course in Air Transportability.

Each company trained for three days. The first two days they learned the technique of loading and securing their equipment into a Troop Carrier ship. On the morning of the third day they loaded the planes with a good sample of what they might carry on an actual mission—jeeps, weapons, ammunition, rations and water. Then the men donned combat equipment and parachutes and went for a short flight.

Though such training is of combat nature, it has a valid peacetime use too. These men, being air-trained, could be rapidly transported within the country in the event of disaster—flood, fire, earthquake—when they would be needed to keep order and protect property.

CARDED

TANK ARMAMENT

by the School of Tank Technology[★]

1. Design Procedure

THE tank-mounting designer can lay out a mounting for the gun with sighting gear and laying controls, building around them a fighting chamber with sufficient space for the crew, ammunition and other storage. He must fit this fighting chamber into the limits of weight, height and space between tracks allowed him by the general designer of the whole tank in view of transportation restrictions, and enclose it with armor of a specified thickness, in which must be fitted adequate means of outside vision.

If the mounting designer cannot get all this into a turret with all-round traverse and yet keep within the limitations of the general designer, the latter may be forced to offer the soldier a limited-traverse equipment, like the German Jagdpanther and Jagdtiger. The soldier has then to decide whether a powerful gun and thick armor are worth more tactically than 360 degrees of traverse.

2. Selection of a Tank Gun

All battle experience goes to show that infantry are the most important "arm" in any army. The destruction of the enemy infantry is the main purpose of all arms, including tanks, in our own army. Thus, for most types of tank, the enemy infantry, the defenses they hold, and their supporting artillery, are the main targets. The best type of projectile against such targets is high explosive shell.

Unfortunately, all armored vehicles are vulnerable, not only to ground antitank guns, but also to antitank guns mounted in enemy armored vehicles. Thus, the tank may be prevented from carrying out its main task, unless it can first defeat the enemy "armor." This requires an armor-piercing projectile.

Against infantry and "soft" targets, H.E. shell, even though small, will usually have some effect, whether these be direct hits or only near misses. On the other hand, against "hard" targets (i.e. tanks), only a direct hit with a suitably designed shell large enough to pierce the armor will be effective. In other words, the requirements for H.E. performance are not very critical, whereas those for armor penetration are extremely so. Thus, although H. E. firing may be the main purpose of tanks, A.P. firing will require more attention in design.

For armor penetration, the best type of projectile is the high velocity shot or shell, which depends mainly on its weight and striking velocity for effect. This necessitates a gun of caliber large enough to fire a shot of adequate weight, with a long barrel in which to develop sufficient velocity, and a large chamber in which to burn the amount of propellant required to provide the velocity. This results in a large and heavy cartridge and a cumbersome gun of short life.

For high explosive effect, one requires a shell with a large capacity for explosive filling. To get this, it is generally considered that the caliber of the gun should be at least 3 inches. If this shell is to be fired from the same gun with the same velocity as the A.P. it will have to be so thick-walled to withstand the severe firing stresses, as seriously to reduce its capacity for H.E. filling. Moreover, high velocities reduce the effectiveness of H.E. shell in several ways. For H.E. then, it is much better to use a low velocity, high capacity shell, which only requires a short gun with a small charge. This gives a small round, of which a large number can be carried in the tank, and a gun which is easy to mount in a turret and has a long life. Such a gun will, of course, be unable to fire any A.P. projectile, except hollow charge, which is inferior in accuracy and penetration.

The size of H.E. shell required is unlikely to increase much in the future because infantry can become neither more splinter resistant, nor able to make stronger foxholes! Tank armor, however, is getting thicker and thicker, so that A.P. weapons must get bigger and bigger as time goes on.

The soldier is then faced with the following problem:

He has to ask the designer to give him an A.P. projectile and gun powerful enough to penetrate enemy armor, yet this is only for what is really a secondary or support rôle. For present conditions this gun will probably have a caliber of over 3 inches. Shall he also ask the designer to produce for him a separate gun for firing H.E. to carry out the main task, and relegate the A.P. weapon entirely to a support rôle, or shall he fire his H.E. out of the A.P. weapon (probably with a reduced charge to give lower velocity)?

If he uses the A.P. weapon for H.E., he will not be able to carry many H.E. rounds, because of their uneconomically large cartridge cases, and because some of the stowage will already be occupied with A.P. The large cartridge will give only a low rate of fire. Moreover, the rapid wear with A.P. will necessitate frequent calibration for indirect fire and semi-indirect H.E. shooting.

If separate A.P. and H.E. weapons are asked for in emergency the A.P. weapon must, of course, be able to fire H.E. and the H.E. weapon hollow charge (in lieu of A.P.).

The decision the soldier arrives at, will depend on tactical considerations outside the scope of this article.

3. The Tank Gun Designer's Problem

The ideal tank gun should fulfill the following major requirements in order of importance:

[★] *The Tank*, British publication.

(1) A light, short cartridge, the complete round not weighing more than about 45 lbs. with an extreme upper limit of 65 lbs. when the gun is mounted with limited traverse in the hull of the vehicle.
(2) An adequate life.
(3) A barrel as short as possible, with center of gravity as near the breech as possible.

Such other features as weight of projectile, caliber, and muzzle velocity must be so adjusted as best to fit the above and yet provide the specified performance. It should be noted here that the weight of the gun is of minor importance, although lightness is desirable from the point of view of turret balance.

For H.E. firing only it is quite easy to comply with the foregoing specification, but modern penetration requirements, even when special tungsten-carbide-cored shot are to be used, are so difficult to meet that it may not be possible in the future to provide a gun with reasonable life without exceeding the cartridge weight limitations—particularly if an all-round traverse turret is insisted on. It is important to note that the difficulty does not arise in loading the gun, but in getting the ammunition out of the stowage into a position from which it can be loaded. In this situation the fixed Q.F. cartridge ceases to be the quickest and easiest to handle inside an armored vehicle. Instead the round may have to be split into two or more easily handled components—the Separate Q.F. cartridge.

4. Some of the Problems of the Mounting Designer

The first endeavor of the mounting designer is to give a sufficient arc of elevation and depression for the weapons and yet provide adequate protection and ease of control.

If the arc is large it will be difficult to design a mantlet which does not leave gaps at the top or bottom at full depression or elevation, and is also completely splash proof against heavy small-arms fire. Current British practice is to provide 20 degrees elevation and 12 degrees depression, but other countries have had to use less—usually less depression.

As guns get longer and mantlets thicker, the centers of gravity of successive designs of mounting get farther and farther in front of the trunnions. If the designer tries to counteract this by moving the gun back in the mounting he will have to make the turret roof higher to clear the breech of the gun on recoil at full depression. Instead, he must neutralize the muzzle heaviness by a spring or hydropneumatic equilibrator inside the turret.

It is sometimes thought that the designer has difficulty in making the mounting strong enough to take the trunnion pull of the gun. So far is this from being a difficulty that several designers have been tempted to dispense with the recoil system and mount the gun rigidly in the cradle. They have had some measure of success, although other difficulties were introduced.

The recoil system is still then an essential of a tank gun mounting, and there is generally no difficulty in providing sufficient room behind the gun for recoil. If there were not enough room for recoil there would certainly not be enough space to load the large cartridges fired by present-day tank guns. The designer's two problems here are overheating and the use of ammunition of different muzzle velocities.

The function of the buffer is to dissipate the recoil energy of the gun by converting it to heat (due to the friction of oil passing through ports). Obviously, if a high rate of fire is maintained for some time the buffer will get very hot indeed, with the result that the gun fails to run out. Some modern guns may have a very large recoil energy to be converted to heat, so the designer has to provide rather a large capacity of oil to absorb it.

As stated earlier, when a gun fires both A.P. and H.E. it is better to fire the H.E. at a much lower muzzle velocity than is necessary for A.P. This results in a shorter recoil. It is then a problem to design a recoil system which will function equally well with both high and low velocity ammunition and allow sufficient length of recoil for the semi-automatic gear to function both types.

Another question that needs clearing up is the purpose of the muzzle brake. Its function is to reduce the backward momentum of the gun by deflecting to the side or rear some of the high pressure gases which emerge with high velocity from the muzzle after the projectile has left. The principle is the same as that of jet propulsion, the deflected gases giving a forward thrust on the muzzle. In general, a muzzle brake is undesirable on a tank gun, as it greatly increases the out-of-balance of the mounting and causes the gun to "whip" when travelling. It also increases the risk of injury to troops by diverting the blast to the rear. The chief reasons for fitting a brake are:

(a) When the designer "up-guns" an existing vehicle to counter the introduction of heavier armor by the enemy. This enables him to use the original recoil system.
(b) To reduce the amount of recoil energy which has to be converted to heat by the buffer, and so prevent overheating.
(c) To obtain improved steadiness of the vehicle when firing—especially armored cars.
(d) To improve observation by deflecting muzzle smoke out sideways. Whether it is successful in this depends a good deal on the wind and the dustiness of the ground.

5. Further Considerations

In an article of this length it has only been possible to discuss the selection and mounting of a tank gun. Such other topics as sighting and fire control, laying controls and the best layout of ammunition stowage would require a great deal of space to themselves.

CARDED

FLAIL TANKS

by Brigadier Nigel Duncan[★]

Brigadier Duncan commanded the 30th Armored Brigade in the British Liberation Army. This was part of the famous 79th British Armored Division that manned all the specialist armored devices such as Crocodiles, Flails, and Buffalos. Later he was second in command of the Specialized Armored Development Establishment. With his vast war experience with armor and the knowledge gained thereby Brigadier Duncan can well be considered an authority on armor.

MINES appeared in increasing numbers during the campaign in Africa until by 1942 they had become a very serious menace to the movement of troops and vehicles. Vast numbers of both antitank and antipersonnel mines had been laid by the enemy, and since they were covered by antitank or machine guns, clearance by hand was slow and expensive in casualties.

In order to speed up the rate of an advance, a tank was modified to detonate mines by mechanical means. It consisted of a rotor, suspended between arms protruding from the front of the tank, carrying chains on it and revolved by two auxiliary engines behind the turret. As the rotor turned the chains flailed the ground and the force of their impact detonated the mines. The machines were not very reliable but proved effective in Alamein where they were used singly to sweep a lane wide enough for one tank.

From these early machines several later patterns were developed. The last was the Crab, a Sherman tank carrying a rotor which was driven from the main engine and retaining the main armament—in other words as near a standard tank as any specialist weapon could be.

The Crab rotor was nine inches wider than the overall track width to provide a slight margin of safety and to make turning possible. The rotor centers were four feet and three inches from the ground and the radius to the tip of the chain was six feet.

Design of Crab

Later Crabs were self-contouring—the height of the rotor being conditioned by the beat of the chain on the ground, thus enabling it to follow slight inequalities better than those first models where depression of the rotor was limited by a stop. The end plates of the rotor carried wire-cutting blades which ran between cutter blocks to reduce the chance of fouling the chains. The Crab was designed for use at a flailing speed of one and a quarter miles per hour when the rotor required approximately 150 brake horsepower to drive it, the balance being available to move the tank. The rotor which was cylindrical was "dressed" with 43 chains attached to welded lugs, arranged in a spiral which, with the tank in first gear, gave a strike on the ground every four inches in both a forward and lateral direction, thus ensuring that the pressure plate of a Teller mine was certain to be struck. A dog clutch allowed, at will, power from the main shaft to be transmitted to a sprocket outside the tank from which a shaft ran alongside the jib to a bevel box which drove the rotor. The tank retained its normal armament less the lap Browning and some 20 rounds of 75mm ammunition which were displaced by the power take-off assembly.

The technique for flailing was developed under the direction of Major General Sir Percy Hobart, K.B.E., C.B., D.S.O., M.C., Commander 79th Armored Division, and was based on the "assault team," a combination of flails and engineer tanks, the former to clear lanes through mines, the latter to bridge obstacles. In order to provide sufficient room to handle the special bridges and fascines, and to allow tanks to pass each other, a 24-foot-wide lane was laid down as the minimum acceptable under service conditions. Three flail tanks working in echelon could provide this, allowing one foot overlap, but the standard of driving was necessarily very high. To provide for casualties a reserve of two tanks was considered necessary for each team, and this determined the size of a flail troop as five. Except in the seaborne assault when space in landing craft was all important, this troop was never split. Three flails echeloned to the right or left according to the direction of the wind, each one about 25 yards behind the other, moved at top speed to the edge of the mine field. The rotor driving gear was then engaged and the leading tank started to flail followed by the

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[★] Commander Second British Armored Brigade in Italy.

other two. Reserve tanks in the troop remained at the entrance to the lane giving covering fire until called forward to replace a casualty.

Three flail troops formed a squadron and there were three squadrons in a regiment. This organization was based on an infantry battalion with two companies forward. Each company required a "mine free" lane through the field and one reserve lane was needed by the battalion in case one of the company lanes was blocked. A flail regiment could therefore provide the necessary lanes for a Brigade attacking with two infantry battalions forward, leaving one flail squadron in reserve to support the reserve battalion in the exploitation role. The reserve squadron together with any reserve tanks not actually flailing was used in the initial stages to provide covering fire. The slow flailing speed made the tanks an easy target and tank gunnery from the supporting tanks became of the greatest importance. Good range facilities were available in England and a very high standard of gunnery was reached which materially reduced casualties.

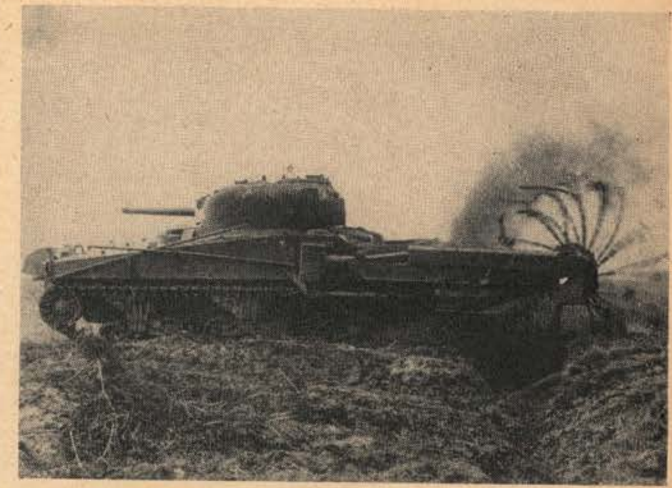
Battle With Dust

Station keeping while flailing was not easy. The impact of the chains on the ground threw up dust or mud which made visibility very difficult. This dust cloud did not however rise very high and the adoption of special cowls over the periscopes, water spray devices to clear the glasses, and special markers on high standards eventually overcame the difficulty. The dust was sucked into the interior of the tank through the normal cooling intakes but although this reduced visibility inside the tank it never affected the efficiency of the crews. To prevent the turret races being jammed by dust, which would render the traverse slow or inoperative a turret ring seal was produced. A canvas shield over the 75mm mantlet with openings for the main armament, the telescope and the .30 Browning was also provided to avoid clogging the elevating mechanism.

The detonation of a single Teller mine had curiously little effect inside the tank. It was possible to hear the explosion and the tank shuddered as a ship will when a depth charge goes off some considerable way from her. Under the turret lights the dust-laden air became more turbulent and the engine note rose as revolutions increased with the raising of the rotor by the blast of the mine—otherwise nothing, no shock, no discomfort, no shattering effect on crew or machine.

Outside, the effect of the mine was to raise the rotor in the air lifting the chains momentarily clear of the ground. The rotor assembly fell by force of gravity and the tank continued to flail.

Chains were a difficulty; originally these were hand forged and proved most satisfactory. Productive capacity available could not meet requirements and a flash welded chain proved a complete failure. Ultimately a pattern of roller link chain with a link and swivel to allow the striking end to turn was adopted and proved satisfactory. It is not possible to give any accurate figures for the chain damage per mine. One chain—that which hit the mine—always lost some of its length. Of the chains immediately adjacent any number up to four might be damaged, either twisted or with links blown off. A shortened chain brought the force of the explosion immediately below the rotor and rendered it more liable to damage. The known maximum number of single Tellers put up by a single Crab without redressing chains is 34. On service 15 to 16 were frequently detonated without casualties, but the rotor was usually torn by blast and often so bowed by the force of the explosion that it was necessary to change it. Double and triple Teller mines, buried one above the other were encountered; the double mine usually damaged the rotor and the triple Tellers usually destroyed the Crabs. In the later stages of the Canadian attack toward Wilhelmshaven depth charges and 11″ shells with pressure plates were encountered. The depth charge destroyed the flailing gear without harm to the crew, but the 11-inch shell set at an angle acted like a fougasse and killed both driver and co-driver and damaged the tank beyond use.



British Official Photo

The "Crab" at work. This is the latest development in flail tanks. Earlier such flails as "The Baron" mounted on a Matilda tank chassis was used.

The 30th Armored Brigade was entirely equipped with flails. XXII Dragoons and the Westminster Dragoons took part in the assault on Normandy in 1944. Due to limitations in the numbers of landing craft the normal troop organization was broken up. Either two or three tanks were loaded in each Landing Craft Tank, the balance being engineer tanks, flame throwers or bulldozers. Over 80 per cent of the required lanes were successfully made on Second Army front, through which other armor, infantry, vehicles and equipment of all kinds poured to hold the bridgehead.

Nine Squadrons

The First Lothian and Border Yeomanry landed a fortnight after D-Day, giving a total of nine squadrons—145 flails available to meet requirements. They proved effective against Teller and Riegal antitank mines, and against Schu mines which appeared in ever-increasing numbers. Practically every action where normal armor was used in the bridgehead involved the sweeping of lanes; and only the centralization of the equipment under 79th Armored Division made it possible to meet requirements. Squadrons were switched continually between Divisions and Corps to meet an ever-changing situation.

Flail tanks accompanied the Canadian Army in the breakout from Caen and the subsequent Falaise pocket action. Others moved with the Second British Army through Caumont and crossed the Seine with both armies. The assault on the Channel fortresses, Havre, Boulogne and Calais was made possible only by the use of flail tanks. Extensive mine belts covered all three towns but presented no real difficulty to the assault teams.

Mines were encountered again in some numbers on the South bank of the Scheldt where the swampy ground made flailing a difficult task; also round Nijmegen and on the Siegfried Line in the Reichswald Forest. Very few were met on the actual Rhine crossing where large numbers had been expected. It is difficult to ascertain the reason for this but it may well have been due to the lack of transport caused by Britain's Royal Air Force activities.

Flail squadrons from the 30th Armored Brigade worked with the Ninth U. S. Army on several occasions when they were confronted with mine fields, notably at the commencement of the offensive beyond the Roer which brought the Americans to the banks of the Rhine.

As the advance progressed into Germany some mines were encountered covering the biggest ports, but the numbers were never as great as had been expected.

So far the flail has proved the most satisfactory mine clearer yet devised. With the design used in France, 90 per cent safety under reasonable ground conditions with mines buried not more than four inches deep, could be guaranteed, and the safety factor was often higher than this. Further investigations may produce a new combination of rotor height and speed, coupled with a new chain design, which may make for greater efficiency.

Regiments of the 30th Armored Brigade in all detonated some 5,500 antitank mines from D-Day to VE-Day. This takes no account of the innumerable antipersonnel mines also destroyed. At the most conservative estimate this represents a very substantial saving on men's lives and material at a cost—thanks to good training and the efficiency of the crews—of relatively few lives.

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FLYING FOOT SOLDIERS

FOOT SOLDIERS may sprout wings in the event of another war if present day Army Ground Forces leaders have their way in the development of "flying armies."

And not only will troops be transported by air to the field of battle, their equipment including everything from a rifle up to a heavy tank will also wing its way through the sky at speeds estimated anywhere from 135 to 350 miles per hour.

These possibilities have already gone beyond the theory stage. The Airborne School at Fort Benning, Georgia, began on September 5, a course established by direction of Headquarters Army Ground Forces, to instruct ground force officers in the principles and techniques of the movement of troops, equipment and supplies by air. This course of 120 hours of classroom and field instruction will apply the principles of war to air transported troops, their employment in battle and the basic responsibilities of the air and ground units for the operation.

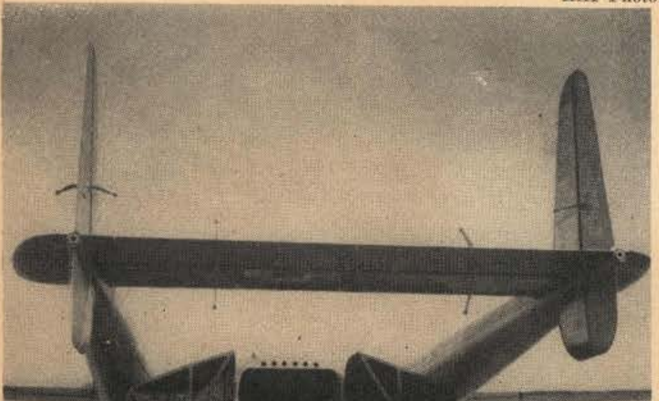
Ultimate goal of the program is aimed at making the entire army air transportable.

Air transport, according to the experts, is the key to speed, flexibility, multiple uses and elusiveness—all the necessary elements to a successful force in a modern war. Once armies become air transportable no longer will mud, blown out bridges and congested roads hold up the movement of a military unit. Aircraft will bypass these obstacles that have given ground troops so much trouble in past wars.

There are two types of troops transported by air. First, there are the "airborne" units which are trained and equipped to enter combat by air and for making assault glider landings. These units include parachute and glider troops. In World War II such units were employed in Sicily, Normandy, France, Holland, Corregidor and others.

Here a light tank is being loaded into a "flying boxcar" —C-82. This aircraft has a fuselage large enough to carry a two-and-a-half ton truck.

AAF Photo



The second type is "air transported." These are normal ground troops with their equipment who can be transported by air and assigned a ground tactical role upon arrival at their destination. These troops do not parachute to the ground or ride in assault gliders. They are nothing more than ground troops transported by air.

Examples of this second type include the air transporting of the 11th Airborne Division from Okinawa to Japan. The Australian Seventh Division was air transported to the Markham Valley in New Guinea after the 503rd Infantry Parachute Regiment made the initial assault from the air.

The Markham Valley engagement is an excellent example of how "airborne" and "air transported" troops will be used together in any further wars. "Airborne" troops will parachute in to make the initial assault while "air transported" troops will follow to support and develop the operation.

There are, however, several drawbacks to air transporting troops at the present time. Such troops would be dependent upon weather for movement and on air superiority for protection and supply. The large Army Air Forces transport planes of today are extremely vulnerable because of their low speed and slight armament. These drawbacks are being studied and the increase in aircraft development is overcoming these hinderances by increasing firepower and mobility of transport planes.

At present the United States does not possess enough air power to make the entire army air transportable. But, the need for larger and better military transport planes has been recognized and an expanded program to develop planes of a sufficient size, quantity and range for a transportable army is under consideration. If the Army Air Forces is not limited too severely by a small budget the possibility of air transportable armies is a thing of the near future; perhaps within five or 10 years from now.

Let us look at the aircraft in existence today that can do the job of transporting troops.

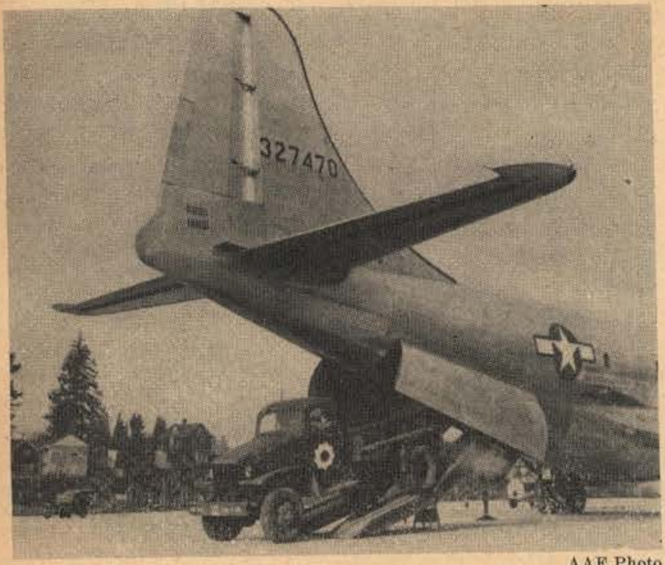
The C-97 Stratocruiser will carry 20,000 pounds of equipment or 142 men thousands of miles.

The C-74 Douglas Globemaster is capable of carrying 125 men or 49,000 pounds of military equipment.

The Consolidated Vultee XC-99, which is being built at San Diego, is reported to be able to carry a 100,000-pound load for a distance of 1,500 miles.

The C-82, the Flying Boxcar, has a fuselage capable of carrying a two-and-a-half ton truck.

These aircraft and others that are still in the develop-



AAF Photo

An army truck backs up the ramp into the commodious fuselage of the C-97. This aircraft at present will carry 20,000 pounds of equipment or 142 men.

ment stage make "flying armies" almost a reality today.

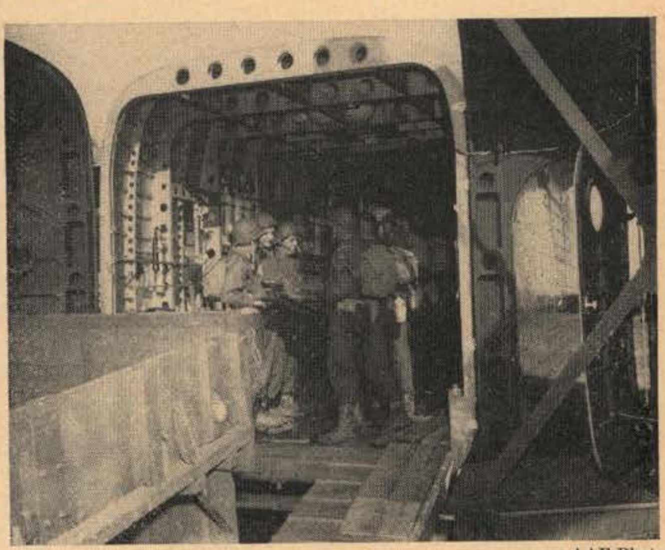
The Army Ordnance Department has developed and manufactured a light airborne tank. Its official name is Tank, Light, T9E1 and it weighs 15,800 pounds. It has a maximum speed of 45 miles per hour and mounts a 37mm gun and one .30 caliber machine gun. This tank is a step toward making armored units air transportable.

It has been reported that the Army Ground Forces has projected plans for making all its weapons of a size and weight to be air transportable by breakdown in the present aircraft or transportable in whole in larger aircraft yet to be developed.

The goal is to transport infantry equipment fully assembled so that the troops can go into immediate action upon landing.

When all problems of transporting troops and equipment by air are solved it will be possible to send any standard infantry or armored division into action hundreds of miles away from their home base in a few hours.

Perhaps in future wars all invasions will be made from the air rather than from the sea as in World War II. It is certainly in the realm of possibility.



AAF Photo

Here is an inside shot of the spacious C-82. This airplane was developed near the end of the war.

* * *

"A general may then employ with the same success, for battles, the offensive or defensive system; but it is indispensable to this effect:

"1st. That, far from limiting himself to a passive defense, he should know how to pass from the defensive to the offensive when the moment has arrived;

"2d. That he should have a sure *coup d'oeil* and much calmness;

"3d. That he command troops upon whom he can count;

"4th. That in retaking the offensive he should not neglect to apply the general principles which would have presided over his order of battle, if he had commenced by being the aggressor;

"5th. That he direct his blows upon the decisive points."—JOMINI.

The Mules of Mars*

by 1st Lieutenant Dan L. Thrapp, QMC

PART I

MOST people think a Quartermaster has about as much business in a combat outfit as a steer in a breeding corral, but the QMC is a diversified outfit and its members sometimes find themselves dodging articles other than the proverbial bale of hay.

You take mulemen, for instance. The Quartermaster officers and men in the pack troops, or those who handle jackasses for Infantry or other branches of the service, occasionally reach the fighting areas. Each arm and service ordinarily trains its own packers, but a man who has a specialist rating as a mule packer usually is received joyously by combat donkey organizations.

When the 475th Infantry Regiment, veteran of the battle for Myitkyina (GI pronunciation: Mish-i-naw), went into intensive training at Camp Landis on the upper Irrawaddy late in 1944, it seemed likely that another campaign was brewing. Burma is strictly a mule country. It followed, then, that a Quartermaster pack officer who wanted to see some action should volunteer, be accepted and assigned—officially as third battalion assistant S-4, unofficially as battalion animal transport officer. This because the T/O called for an unneeded supply man, but no pack officer.

The 475th, together with the 124th Cavalry (dismounted), two battalions of pack artillery, the 31st, 33d, 35th, 37th, 252d, and 253d Quartermaster Pack Troops, and a field hospital, became a long-range penetration outfit, the so-called Mars Task Force. And there were those two damned elephants someone at Regimental Headquarters picked up and brought along. A mule can get used to almost anything, but he draws the line at an animal that hangs down at both ends. Sensible, not knowing whether an elephant is coming or going, the mule is inclined to play safe and take off, regardless of load, underbrush, leader, column, or common courtesy.

Five weeks were not too long to train for a plunge into enemy occupied country, especially when many of the replacements were not primarily Infantrymen. The 475th seemed destined to do its fighting with green soldiers. The deplorable situation at the battle of Myitkyina was widely publicized at the time. After that engagement, during preparation for the Mars job, replacements received to bring the regiment to T/O strength were largely Quartermaster remount men, and the 475th again had to start almost from scratch.

It had this advantage, however: unlike the situation the previous spring, this time there was a strong nucleus of veterans to salt down its greener elements, and it had a few weeks in which to train its new men.

The 35th Pack Troop was assigned to the third battalion. Its animals had been taken off a Liberty ship sent to Ledo by train, and within seven days were hoofing it down the 300-mile road to Myitkyina. There was no time to complete shoeing them, and the result was that they arrived at Camp Landis in very bad condition. An extra week at Ledo putting at least front shoes on the mules would have saved innumerable headaches for us later on.

Every effort was made to get enough animals in shape in time to get the battalion on the road. Saddles must be fitted—an important factor in mule operations, of which more later—and gun and ammunition hangars located, made, stolen, or secured on requisition. Sick mules needed doctoring, and all of them must be shod or re-shod.

A big job was to assign mules to a permanent task. Success of the mission would depend to some degree on how accurately we judged the capacities of each animal and how well each mule was "classified."

For example, there was no need to assign a stocky, solid, well-gaited mule to hauling grain, when gun and ammunition mules were needed. A pack troop is authorized nearly 300 animals, while the personnel totals about 75. Pack troopers are mounted on mules and herd their loaded animals, normally by platoons. That is the most efficient manner of working pack animals, because the mule can pick his own way and, to some extent, his gait; he can make things easy for himself. That method of operation is best for situations where packers must move supplies a comparatively short distance and do not have to operate with foot troops in the same column.

Naturally, when pack mules become part of a moving column, this system is impractical. The herd of mules, moving some five to six miles an hour, would constantly overrun the foot soldier, and doughs don't like that. On the other hand, the animals cannot be started out before the foot troops because there is the question of security for the animals, and there is also the quite important factor that the foot troops want their machine guns, ammunition, and mortars along with them, just in case. The same objections hold regarding advisability of running the mules up to the foot soldiers later in the day. A mule, like a man, is most efficient if he can be worked from dawn to noon or about 1300, rather than from, say, 1000 till 1700.

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*The Quartermaster Review.

Mulemen have a great deal to do when camp is made, and their most important task is to take care of their animals and to graze them. Just as man cannot live on bread alone, so a mule won't go far on just grain. Or very far without it, either. The point is that bivouac should be established early enough in the day so that the animals can get their two hours or more grazing and can be properly rubbed down and picketed for the night.

For these and other reasons it was necessary to take the mules along with the column, and so each animal had to be led by a man on foot. Thus, the pack troop retained about seventy-two mules, one to be led by each man, and the other animals—some 220 of them—were turned over to the battalion, where they were divided, forty-two to each rifle company and the remainder to headquarters company and battalion headquarters.

Rifle companies assigned ten animals to headquarters and weapons sections and divided the rest among the rifle platoons. Headquarters company used about forty-five mules in the heavy weapons platoon, and split the rest among transportation, communication, pioneer and demolition, and intelligence and reconnaissance platoons. The medics needed some animals, and besides, twelve saddle mules were taken along, ten of them for casualty evacuation.

In the heavy weapons platoon, four mules were assigned each heavy machine gun and four each mortar—one in each instance to carry the weapon, the other three to pack ammunition. Additionally, four mules were to carry piecemeal a short-barreled pack 37mm., by means of which we hoped to spray Jap-bearing jungles with canister; other animals carried bazookas with ammunition, and incidentals. The set-up in the rifle companies roughly paralleled this, except that they were authorized light for heavy machine guns, and had but one 81mm. mortar, filling out with 60mm. weapons.

Mule packers of the 124th Cavalry Regiment and their animals push across a pontoon bridge in rugged Burma.

Signal Corps Photo

The Quartermasters have been using mules since the Corps was first organized. George Washington is rumored to have introduced the long-eared horse-donkey hybrid to this country by the progeny of some jacks he purchased in Spain, and some mules reputedly were used by both armies during the Revolution. As a result of almost two centuries of experience, the QMC has determined a lot of things about the animals.

A mule can carry about one third of his weight. The Army cargo packsaddle, with trappings, weighs in the neighborhood of 100 pounds, and the average mule we worked would weigh from 1,000 to 1,200 pounds. Stouter mules are kept for the artillery, which has the heaviest, most awkward loads.

Thus, you can figure that a mule payload should not go much over 200 pounds. For a long campaign, such as ours, we tried to keep each burden down to 180 pounds, and succeeded pretty well on the whole.

Our heaviest loads normally would be machine-gun ammunition, one animal's share consisting of ten 21-pound cans, for a total of 210 pounds. The load, however, was evenly balanced—most important factor in animal packing—and so was not too much.

In the weeks of training marches and preparation we worked out these and other problems. Supply was not up to zone of the interior standards in Burma in 1944, and we could not count on receiving what we requisitioned, so we had to make provision to acquire necessary items by means other than orthodox.

We gradually acquired enough of most items, although some of the equipment was not in good repair and there were no facilities at Myitkyina for renovating it. We made some hangars and improvised others, acquired a set of horseshoeing tools and saddler's equipment, and cut the customary pack-troop equipment to the bone. For instance we took along no picket lines, because we couldn't spare the animals to carry them, and successfully employed lash ropes instead; we took no rigging covers; we drastically reduced the number of mantas—canvas used to wrap individual loads—needed. Each animal carried a spare set of pre-fitted horseshoes and we divided up spare halters, shanks, breeching, etc., to avoid making special loads of these things.

Our worst headache was the mules. They had scarcely rested from their 300-mile jaunt down the Ledo Road, and were about to take off on an equally long journey, this time over no road at all. We had no veterinary officer with the battalion at the start, but depended upon the services of a bunch of fine vet technicians who perhaps did more than anyone else to get the show on the road.

At that we took thirty mules out of the sick corral and eight out of the hospital the morning we crossed the IP. We were proud of the fact that until we struck our first combat, one month and 150 miles later at Tonkwa, we had lost but two animals, one through heat exhaustion and the other from an unknown cause. The rest of the animals were in better shape then they were the morning we left Myitkyina.

The first stage of the campaign—the journey to Tonkwa—was in the nature of a shakedown cruise.

Brigadier (later Major) General Merrill, leader of the famed Burma Marauders, has been quoted as making the classic definition of the troubles of the leader who handles both men and mules. After the Marauder campaign from Ledo to Myitkyina. Merrill said:

"Next time give me mule skinners instead of doughboys, for it is easier to make doughboys out of mule skinners than mule skinners out of doughboys."

The general spoke from experience. There are tricks to leading mules, just as there are to anything else, and it sometimes seemed that we might have better luck if the animals had led the men. The average mule is one of the most intelligent, and certainly one of the most sure-footed, animals in the world. He can see a trail where a man can see nothing but rock. If left to his own devices he will never stumble, rarely slip or bog himself down, and almost never hurt himself. When, however, he is led by a man he can perhaps get into more trouble than any other creature on the face of the globe, and although his difficulty is directly attributable to his inexperienced leader, the animal gets the blame. We occasionally lost animals over the sides of mountains, in rivers or bogs, but we would have lost not a single one had they been free to choose their own way.

We crossed the Irrawaddy on an eight-mule ferry the second day of the campaign. Because of the danger that an animal might fall off the ferry, we unpacked them and repacked on the other side of the stream. The Irrawaddy is a swift-flowing river, wide, deep, muddy and cold, but the entire battalion crossed in less than a day. By reaching the other side before noon we had a good opportunity to graze the animals, and since they were on the wrong side of the river, there was no danger that they would suddenly recall the delights of their old Camp Landis stamping ground and take off. We found an enclosed paddy grown to grass and turned the animals loose, herding them on foot. We had no bell mares, of course, and from this time forward, herded the mules afoot when we grazed them, if the situation permitted. It proved impractical to send leaders out with their individual animals to graze them. The temptation to tie the mule to a tree and catch up on mattress nomenclature proved too strong for some.

On one occasion we tried tethering the animals to individual trees, using 30-foot lair ropes and leaving a couple of men on guard to untangle them, but a couple of serious rope burns convinced even the laziest that that wasn't a good idea. Rope burns perhaps cause more injuries to horses and mules than any other single thing, and it required constant vigilance to keep picket lines tight and halter shanks tied short enough to prevent the animals getting ropes twisted around their feet.

Sometimes when we bivouacked in the jungle or heavy forest it was impossible to find grassy spots for pasture. We cut either banana or bamboo leaves for the animals in that case. They liked the bamboo best and it was better for them, because the banana leaves have more water content than roughage.

We carried three days'—sometimes four days'—rations with us. Each donkey normally carried one day's grain in addition to his regular pack, and transportation mules in the headquarters sections carried grain in bulk to make up the other two days' supply. Each mule was allotted ten pounds of grain a day and the usual mixture included barley, peas or beans, and salt. The men carried three days' K or C rations, and one day's D ration, or at least they were issued those rations and carried that part of them they wanted or thought they could use.

A major task was to make the men carry their own load and not slip it onto the mules. By some quirk of T/O reasoning, mule leaders were authorized Garands rather than the light, less awkward carbines they should have carried. In addition, each man was required to carry a pack containing his bedding, rations, and other personal paraphernalia, and at times the temptation was considerable to slip the rifle onto the mule and put a few rations into the morning manta of organizational equipment. Some mules gradually developed into poor leaders and habitually hung back on the lead rope. The boys, carrying heavy packs plus heavy rifles plus steel helmets (most of which soon got "lost"), and dragging, all day long, a 1,200-pound mule, were mightily tempted to abandon what religion they possessed, and lurid language developed like a fog around the more obstinate of the animals. Riflemen had it comparatively soft during most of the campaign. When the bivouac area was reached, they had merely to look out for themselves and take the usual security precautions. The mule handlers, on the other hand, had barely begun their day's work. The argument, of course, was advanced that the riflemen were more exposed to danger from the enemy than the mule skinners, but that point was debatable. In addition, the sweetest-tempered mule knows how to kick, and is glad to do it, and for weeks we had more casualties from mules than from Japs.

We were supplied by air-drop every three or four days. C-47s and C-46s droned in by the dozen over a previously selected and marked drop field and parachuted rations and ammunition and requisitioned items to us, then free-dropped grain. Occasionally a plane load of grain would get mixed up with parachuted loads and we had some casualties and a couple of deaths from that cause. An 80-pound sack of grain gathering momentum through a thousand feet of space can hit a man pretty fast and pretty hard.

Once, near a place called Mong Hkok, the only available spot for a drop field was in a narrow valley with surrounding hills so high that planes could not get a good shot at the field. A "stick" of grain sacks thudded across a series of picket lines and wrecked the battalion aid station, killing a Chinese soldier standing near by. Another time one of the best packers in my platoon was loading a mule while rations were being parachuted down on the field. A grain plane came in unexpectedly and free-dropped a dozen sacks, one of them hitting the packer. He was carrying a carbine across his back and the sack hit him on the shoulder, snapping the weapon into three pieces. The packer was evacuated with what the medics feared was a broken neck, but fortunately they were mistaken and he recovered.

The march south to our first combat was mostly over level country, the greatest difficulty being occasional bogs or river crossings.

The second battalion lost a couple of mules during a moonlight river crossing. Again a ferry had been provided, but the mules were not unpacked and two of them fell off the raft, their loads spinning them belly up and causing them to drown.

No climbing was required during this first stage—nothing but a dogged plodding through dust and heat. Yet this was a difficult period for the animals. The column walked at the pace of infantry. The average rate was just a little over two miles each forty-five minutes, followed by a fifteen-minute break. We took advantage of every halt to let the animals graze, and encouraged the men to turn them loose during this period even if it meant a short search when the column got under way again. After the first few days we ceased taking time out for the noon meal, but nevertheless we marched at the rate of foot soldiery, and the animals, even on a short hike, had to be loaded well into the heat of the day. This cut down on the grazing time we could give them and tired them extravagantly, since they could not be unpacked during the quarter-hour rest periods and thus derived no benefit from them.

On halts of twenty minutes or more we did unpack the mules, but often we did not know how long a halt was to be, since it usually came as a result of someone fouling up ahead somewhere and we had no contact with the head of the column except for urgent matters.

We skirted besieged Bhamo close enough to hear Chinese-manned .30-caliber heavies talking to Nambus, and went on south to Sikaw and beyond. It was somewhere along in here that I established the Burma 300-yard foot record. I was attempting to coax a skittish mule past an elephant at the time. Everything would have been okay, had the pachyderm not decided to tickle the mule on the business end with his trunk. The mule took off, and since I was on the other end of his halter shank, I took off, too.

The second battalion was committed at Tonkwa, and I Company from the third battalion, and part of the heavy weapons platoon of headquarters company, were assigned the task of cleaning out a patch of woods. Mule packers from the transportation platoon and others were employed to pack ammunition and supplies to both the second battalion and the elements of the third engaging the Japanese. Most of the work was short hauls, occasionally under inaccurate sniper fire. We suffered no casualties from this fire.

Our bivouac area was some two miles back of the second battalion's front positions. The Japanese had four field guns we called 77mm., although they actually were 75mm., chambered slightly larger than our 75s so they could use our ammunition and we could not use theirs.

They had excellently camouflaged positions for their guns, and in the morning and again in the evening would loose a salvo or two, then move their pieces. They were zeroed in on our bivouac area at a river crossing, and their fire caused us some casualties in men and animals. One tree burst accounted for seven animals. Another shell cut between two mules tied to a picket line and burst about eight feet behind them, but injured neither.

After a couple of days' fighting, the Japanese abandoned the Tonkwa sector and our units moved up about four miles across an immense paddy, now grown to grass, and into a wood, where they bivouacked near some abandoned enemy positions. Mules were used once or twice to pack supplies into the advanced positions, but otherwise were kept back well out of possible artillery range. Mules are difficult to replace under Burmese combat conditions. Patrol activity established that the Japanese had at least temporarily given up all the territory north of the Schweli River loop, although their patrols crisscrossed the area, as did ours. They supplied their patrols by means of pack elephants or little pack ponies or diminutive mules, using the typical Chinese wooden packsaddle. Chinese troops captured some of the little ponies, about the size of Shetlands, and did a brisk business trading them to GIs for cigarettes, flashlights, or other items they could later convert to cash in China.

Eventually, however, the brass arrived and, distressed by the unorthodox-looking "toy" animals in the outfit, decreed that the ponies were apt to spread disease among our mules and ordered their abandonment. This despite the fact that throughout the campaign our Kachin scouts used the same animals in our column, grazing and feeding and packing them alongside our mules, with no disastrous effects.

Even during a campaign one can get a little time off, and on Christmas Eve we spent the day hunting. Flocks of pea fowl were common, and they tasted just like turkey; a couple of the huge, 40-inch-long Burma black squirrels were good; and one of the boys even shot, cooked, and ate a tremendous hornbill, which looked more like a buzzard than anything I ever before saw in a cooking pot.

The Chinese came back to relieve us shortly after Christmas, and by New Year's Eve the entire regiment had turned east and plunged into the mountains toward the Burma Road.

(To be concluded ,

Japanese Animals In Siam*

by Lieutenant Colonel C. R. D. Gray

AFTER the defeat of Japan one of the problems in the South East Asia Command was the disposal of the Japanese Army animals known to be scattered all over the countries in which Japanese forces had been operating. In principle, it was ruled that (1) no animals would be backloaded to India because of the danger of spreading *Epizootic lymphangitis,* and because India already had a surplus of Army animals; and (2) all animals fit for further work would be held and disposed of in the best interests of the countries concerned, through Remount channels, in conjunction with the local civil authorities.

In Burma, Malaya and French Indo-China, non-belligerent countries overrun by the Japanese, the problem was one of tracing the animals, and returning them to their former owners, or distributing them to civil authorities, without payment, for the rehabilitation of the country. Siam, however, had been an ally of Japan, and all animals found in that country were treated as enemy property, and therefore booty. No mutual aid agreement between Siam and Britain was then in existence, so it was ruled that such animals were to be sold, proceeds being credited to H. M. Government.

The Japanese submitted to us a list of their known animal locations in Siam, but it promised inaccuracy, as a footnote stated simply: "This list being made by tracing memories of investigated members, by the lack of data concerning we regret to say this list not exactly correct."

At the time of our arrival in September, 1945 the railway system had been thoroughly disorganized by the R.A.F., and the few roads were in a very bad state. We began inspections of the Japanese animals, but it took some time owing to these bad communications. Transport was extremely limited; only a few Jeeps had been flown in.

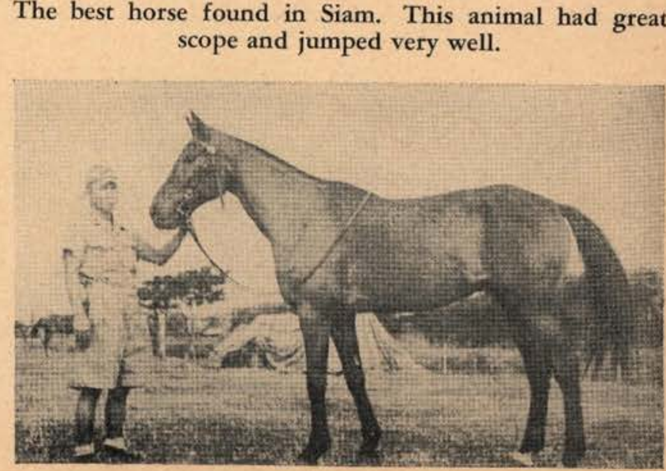
Our first inspection was at Bangkok, where the Japs had 510 animals; all were in poor condition, many being in an appalling state. A few were lying down quite unable to rise, while many had festering and flyblown sores on withers and ribs. Almost all had overgrown feet, dropped soles, and signs of thrush. Over two-thirds were selected for immediate destruction. The disposal of such a large number of dead horses was in itself a problem in the monsoon conditions as the water level was only two feet below ground, but it was solved by digging deep pits on the top of a rifle-range butt. The animals were led up on it, shot, and pushed over—an unpleasant experience.

The Japs had rudimentary ideas on animal management, but owing to the terrible climatic conditions, indifference of their officers, and lack of "horse-knowledge" among all ranks, animals were pitifully looked after. Horses, to them, were merely another method of transport, and suffered the same ill treatment as Jap cars and trucks. They were kept on undrained standings with no bedding. Tight headropes were common, and no grooming was ever done, although boxes of unused brushes and curry combs were found later in the men's barracks. Manes and tails were long and matted. Veterinary attention was skimped, and seemed to consist only in the application of mercurochrome to all sores and cuts; yet there were ample stocks of veterinary equipment all packed in beautifully fitted field chests.

Farriery equipment was excellent, a set consisting of two neat Yakdans fitted with full tools, an anvil and a built-in centrifugal blower. The shoeing, however, was bad, all the usual faults being common, *i.e.*, bad dumping, cutting away of heels and frog, high unnecessary nail holes, and rasping of the outer hoof walls.

The Jap soldiers showed several instances of being fond of their charges, but in curious ways. They could sometimes be seen squatting in front of a horse, hand-feeding it with offers of green grass, yet at the same time they seemed to ignore a cut mouth or a weeping eye. They gave their animals no bedding, but there was

The best horse found in Siam. This animal had great scope and jumped very well.



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*Journal of the United Service Institution of India.

an issue of sun-hats for the horses—large discs of canvas-backed matting with ear holes and a throatlash. As a final instance—when the animals were destroyed many Japs stood at attention and saluted as the horse went down and some wept.

Jap soldiers were educated, and N.C.Os in particular were fond of paper work. They all carried satchels, buckled to their belts, in which were notebooks, writing paper, colored pencils, and often a Jap-English dictionary. In consequence elaborately written feeding charts, notices as to hours of parade, and rules for work and behavior were much in evidence. These were pinned up prominently in every *basha* and living quarter. Army orders were painted (usually with colored chalks) in meticulous picture-writing on blackboards.

This efficiency was carried to extremes. If, for instance, they were asked to say how much fodder was left, they would prepare an elaborate statement in English copperplate writing, showing amounts issued, consumed and required by day, week and month for one horse, all totals being shown in English measure, though their own system is metric. A N.C.O. would sit up all night to do this, and would present it next morning with much bowing and hissing. This hissing is really a quick intake of breath and is an automatic expression of humility and respect by an inferior before talking to or taking leave from a superior.

General discipline was so good that it was almost alarming. All orders were obeyed with a snap and on the run. Saluting was immediate and on sight—though the officer might be 200 yards away. A man carrying a load would drop it, salute, then pick it up again—or if without a hat, would bow deeply despite his burden, then proceed.

In Bangkok advantage was taken of this discipline and willingness to work by showing the Japs our standards of horse-mastership and stable management. Once they saw what was required of them they worked with a will. They were organized into a unit of two troops of four sections each, under their own officers, 45 men in all, and were taught stable routine for grooming, feeding, etc. They called themselves the "Horseguard Corps."

One indifferent interpreter was available at intervals, so most of the work had to be demonstrated by example. After a British Remount officer had groomed a horse in front of them they soon "caught on" and vied with each other in producing a shine on their horses. It was amusing to hear later that there had been much comment about this in their barracks, as it was inconceivable for a Japanese officer to instruct by personal example, let alone touch a horse to clean it.

Most of the Jap animals in Bangkok were pony stallions, and as the prisoners were required for dock labor, and only 45 men could be spared for Remount work, it became difficult to look after the captured animals in their standings, so it was decided to build paddocks for them. These were laid out on the usual Remount "kraal" system and were built without R.E. stores or assistance.

Timber, wire, roofing, etc., were "scrounged" from old bunkers, pillboxes, and disused huts, and a design was drawn by a Remount officer from which the Jap N.C.O.s produced their usual overelaborate plans with scales, distances, etc., all beautifully drawn in colored inks. The work was well done, and soon this unit had built a small depot, complete with six paddocks, a stable of 20 looseboxes, saddle room, office and grain store. A riding track, small school and a set of jumps were added later.

Inspections similar to that carried out at Bangkok were made at other Jap camps throughout Siam by Remount and Veterinary officers. Altogether 5,227 animals were inspected, of which 3,691 were destroyed, 1,536 being retained for disposal. Thus 70 per cent were destroyed, and 30 per cent retained.

Many varied types of animals were found in the Jap Army in Siam chiefly owing to the fact that they had received no reinforcements from Japan, and had made up deficiencies by capture or purchase. They were able to show receipts of all purchases from the Siamese. Here are some of the animals we found:

Japanese Horses.—These were bred in Japan from mixed Jap blood. About half were rides over 15 hands, used by Jap officers and N.C.Os. The remainder were transport horses of Percheron and heavy Waler stamp, and were used in high-wheeled single draught carts or in pair wagons. About 80 per cent were chestnuts; no greys at all were found.

The riding horses were only half-schooled as judged by our standards—with little flexion and rough paces. They were, however, all very quiet to mount and ride, and could be grazed at liberty and caught up at will. The Japs used them merely as a means of transport to march from A to B, and never attempted jumping or school work. In the course of selecting rides for British officers, a Remount officer rode 150 of these horses and found them all very quiet—a particular feature being the way they stood quite motionless when mounted, without being held.

Chinese Ponies.—These were of two types: (*a*) North China (Manchurian) shapeless animals about 13.3 hands, with a long, curly coat, roach back, good bone and uncertain temper; they were used entirely for pack work, and (*b*) South China—a lighter type used for pack work and riding—rather like Kashmiri ponies, but with heavier heads and thick coats.

French Indo-China Ponies.—A light narrow pony, about 12 hands, the same stock as Siamese, but showing a trace of European blood. Many skewbalds, piebalds and duns, but few true colors. A useless type of pony; very excitable and perpetually kicking and screaming, possibly because they were all stallions.

Java and Sumatra Ponies.—These were a mixed bag, some being captures from the Dutch Army, and some obtained from the villages. A light pony about 13 hands, with a breedy head but rather leggy, with cow hocks.

Could be easily recognized as all had prominently split or nicked ears. As rides they were fast, but also nervous and difficult to handle.

Siamese Ponies.—The smallest ponies seen. Known as midgets in Siam, they average 11.2 hands. The Japs used them in small, single draught carts, or as light pack ponies, for bedding rolls, etc. The best were like miniature New Forest ponies; they were extremely hardy, were fed only on grass, and had a very fast pacing trot when ridden.

Burmese Ponies.—A few only were found, brought back during the Jap retreat. They were a light type of 13.3 hands, and were probably captured from Burma Police or Frontier Force.

Indian Ponies.—Two were found, both bearing the "Mona" brand. They were in poor condition, and were destroyed.

Mules.—A mixed bag. A few Indian mules were found, but the majority were Chinese of a poor EI or EII type. Of all the mules found, very few would have been acceptable by our standards.

JAPANESE SADDLERY

Saddles made in Japan were very similar to the British Officers' pattern issue saddle, but had neat detachable panels, which obviated re-stuffing, provided the new panels were available. They had prominent knee-rolls, and were only comfortable if ridden with long leathers. Briddles had a civilian-type curb and bridoon bit, with "rising-sun" brass bosses. Head collars were of string and webbing, worn under the bridle.

A. T. Packsaddles were similar to ours, but had adjustable arches and shaped sidebars. The Japs said that this saddle caused few galls, and that the majority of injuries come from the Chinese "X" pattern packsaddles of rough wood, which they had been forced to use of necessity. A. T. Carts were single draught. Those made in Japan were good, with pressed steel wheels and turned shafts. The larger ones had platform bodies only, not with side rails, as on our A. T. Carts. Many, however, were Chinese carts, with wooden wheels and axles.

The Japanese 37th Division was at Nakon Nayok, a hundred miles north of Bangkok, and it was here that out of 2,699 horses seen, 2,154 had to be destroyed. It was such a large proportion that we investigated the reasons, which were:

(1) This formation had marched by road the whole way from North China to Siam, a distance of 3,500 kilometers;

(2) It was at Shia-Chia-Chaong, S.W. of Peiping, when it received orders to march south to link up with the Southern Forces' drive on the American Airfields in South China;

(3) It covered the distance in four months, averaging 30 kilometers (20 miles) a day, marching six days a week.

(4) *En route* it fought two battles near Changsha, and it was this force that recaptured Kweilin. Moving south it crossed the top of French Indo-China at Vientiane, and from there went through Siam to Bangkok.

Animal casualties in this Division were heavy. Killed in battle numbered 220, died 700, drowned 10, destroyed as unfit 150. These 1,080 animals were replaced by captured Chinese and French Indo-China ponies, no reinforcements being received from Japan. South of Hankow no Army fodder supplies were forthcoming, and all grain and grass had to be obtained locally.

The Japanese stated that owing to the speed of the advance and the tiredness of the troops, the horses seldom got more than two feeds a day. Of the ponies they acquired, the Manchurian type stood up best. On our inspection they were the least emaciated, and had less galls than other types.

While resting at Bangkok, this Division received orders to move south to selected points on the West Coast of Malaya, but the war ended before the move started. Later, when examining their maps, a British Officer who had recently been on the S.E.A.C. Planning Staff, said that their marked destination was to have been the main landing area for our attack had it taken place. We repeated this to the Jap officers, and they showed very great relief—and amusement.

The Jap 15th and 33rd Divisions were at Nakom Patom, sixty miles west of Bangkok. These divisions had borne the worst of the Burma campaign, and were in very poor shape when they got back to Siam. The remnants were magnificent troops, and their discipline was high, even by Jap standards.

Their animals had had a bad time, and their records showed that they lost 5,000 on the retreat from Kohima, mainly from hunger. They ran out of food stocks, and as a result their animals died like flies, all along the escape route. The senior Jap Veterinary Officer said that only five horses returned from the original number at the beginning of the campaign. He also said that the best animals they had were the mules they had captured from the British forces.

A survey of the animal requirements of the Siamese showed that riding horses were required in Bangkok by the Siamese Army for remounting their 1st Cavalry regiment, that small ponies were wanted in the up-country districts, and that a few small ponies were required by the Pasteur Institute for serum manufacture (anti-snake bite). Sales by auction and private treaty were arranged, and two hundred riding horses, and 958 pack ponies and mules were sold.

In addition to the above animals, the Japanese had a few Army dogs, three of which were captured. They were good Alsatians, bred in Japan, and were used for guard duties, being trained to attack any man indicated by their handlers. They were sold by auction and fetched high prices.

Army Will Continue to Encourage Horse Breeding

THE Army will continue to encourage the breeding of horses, according to Colonel Fred L. Hamilton, Chief of the Remount Branch, Office of the Quartermaster General, who says the answer lies chiefly in the benefits which accrue to the civilian horse raisers and users of the nation who have demanded that the horse breeding program, in operation for the last 25 years, be continued by the Government to assure the present high standard of both draft and light breed animals.

Recently Congress appropriated $150,000 to continue the program for the fiscal year ending 1947 under the jurisdiction of The Quartermaster General.

When, during the reorganization of the War Department back to a peacetime basis, the existence of the breeding program was threatened with extinction, horse breeders of nearly all States, who are benefited by the availability of the Army owned breeding stock for the improvement of their own stock, mailed thousands of letters to Congress in protest against the abandonment of the program.

According to Colonel Hamilton, the civilian breeders claimed the following benefits: Fine breed Army stallions are available at widely distributed points throughout the country at fixed and extremely reasonable stud fees; breeders find it possible to instil good blood into their stock, developing horses with better endurance and vitality, and capable of better performance; that since initiation of the breeding plan, more than 200,000 foals have been reported to have been sired by fine-bred Army Remount Stallions, thereby definitely improving the national standards of civilian owned stock.

Based on the Army purchase price, a conservative estimate places the salable value of these colts at least $100.00 over the normal selling price of common stock and this, according to Colonel Hamilton, represents an increase in value of something over $20,000,000.

These and other benefits have accrued to the financial advantage of the horse breeders of the nation in general and fear of discontinuance of the program resulted in a deluge of mail to members in Congress when its appeared that the Remount Breeding Program would be abandoned.

Over the period of years between 1921 and the present, the Quartermaster Remount Service has increased its holdings of stallions from 165 to over 700, by purchases, donations, and the breeding activities at the various Remount Depots where bands of good brood mares are maintained. This number has recently been augmented by the acquisition of some of the finest horses in Europe, acquired as "war booty" from Axis countries. Early in August about 100 fine bred horses arrived in the United States from Bremerhaven, Germany. This means, as a result of victory, acquisition has been made of about 250 of the world's best stallions and brood mares, which include Thoroughbreds, Half-Breds, Arabs, Arab-Kinds and Lippizanners.

At the present time the Remount Branch has more than 500 stallions standing throughout the United States, but it does very little breeding on its own. The stallions are farmed out to agents throughout the country, located principally in horse breeding sections, who may charge not more than a $10.00 stud fee for breeding to mares belonging to others.

The trend toward mechanization of warfare is reflected in a comparison of horse purchases for World War I and World War II. In contrast to the 486,000 horses and mules purchased for World War I, The Quartermaster General Remount Service procured 57,242 for World War II, 55 per cent of which were draft horses and pack mules. The balance were riding horses, a number of which were provided for the Coast Guard Beach Patrols, the training and operation of which were supervised by the Remount Service.

In spite of mechanization, however, pack mules were used to great advantage in the mountainous terrain in Italy, and, although all the reports of World War II have not been completely evaluated, there is ample evidence that in China, Burma, and the South Pacific, animals played an important part in the successful supply of combat troops.

Because of 25 years of good breeding practice and the acquisition of fine stock from other countries, the Quartermaster Remount Service at the present time has one of the finest bands of brood mares in the world and some of the best of the world's stallions standing throughout the country which are available to civilian horse breeders.

The six Remount Purchasing and Breeding Areas distributed to cover the entire United States are:

The Eastern Remount Area, with headquarters at Front Royal, Virginia.

The Central Remount Area, with headquarters at Lexington, Kentucky.

The Northwestern Remount Area, with headquarters at Sheridan, Wyoming.

The West Central Remount Area, with headquarters at Colorado Springs, Colorado.

The Southwestern Remount Area is governed from San Angelo, Texas.

The Western Remount Area has its headquarters at Pomona, California.

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Ten thousand horselovers watch the show at Front Royal, Virginia. Some of the world's finest horses are maintained at this Remount Station.

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Equine Reparations*

by Lieutenant Colonel Gordon W. Cook, Q.M.C.

DURING April 1945 General George S. Patton's Third Army, in its fast sweep across Germany, captured several German Government and German Army horse-breeding farms, and with them several thousand valuable horses. For twenty-five years the United States Army Remount Service has been attempting to improve the breed of riding horses in the United States through a system of placing good stallions with civilian agents throughout the country. When these two seemingly unrelated facts jelled in the mind of Colonel Fred L. Hamilton, Chief, Remount Branch, Field Service Division, Office of The Quartermaster General, this story had its beginning.

During early August, 1945, General Patton returned on temporary duty to Washington, and Colonel Hamilton had a long talk with him about the horse situation in Germany and Europe as a whole. He found that much valuable bloodstock had been captured by the Third Army and was being held in various German Government and German Army horse-breeding farms in the American Occupation Zone. War Department orders were issued directing Colonel Hamilton to proceed to the American Zone of Occupation to select and return to the United States such bloodstock as he felt would be of value in the Army Horse-breeding Program.

In order to appreciate the heritage of the horses which were brought from Germany it might be well to consider briefly the general history of Europe—a long story of conflict and of migrations and transmigrations of whole peoples, in all of which the horse played a major part. The Roman warriors in their chariots roamed the Roman Empire, of which Southern and Central Europe were a part. It is natural to assume that there was a certain amount of fraternization—equine as well as human. In the 9th and 10th Centuries the Magyars came out of Central Asia on horseback, overran Central Europe, and finally settled down in Hungary. Such a march would certainly eliminate the unfit, and the horses that arrived in Europe must have been really rugged. The Magyars were followed by Genghis Khan and his Mongols, and the whole thing was repeated. Then came the Turcanians, who by the 13th Century had overrun all Asia Minor and had secured a foothold in Southern Europe. As late as the end of the 17th Century the Turks were laying siege to Vienna, mounted on horses from Arabia, Syria, and Persia.

From the tested and proven war horses of the ages the Europeans have developed some remarkable light horse breeds. Numerous conflicts and changes of boundaries in more modern times have resulted in an almost continuous blending and amalgamation of this original horse blood. The Europeans, from choice and neces-

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sity, take their horse business very seriously, and through thorough and careful selection they have developed breeds of specific types and for specific needs.

Our own story in America is quite different. The horse is not a native. Our foundation stock consists primarily of inbred wild bands descended from a few horses left by the early Spaniards and the horses brought over by the early colonists. While we have continuously imported heavy draft horses and an occasional English thoroughbred, we have had no great influx of foundation stock. As a result, our Remount Service in the meager twenty-five years of its existence, has been forced to resort to the violent crossing of a heterogeneous lot of horses. We have, therefore, not developed a type that will breed true, and, with our present stock, it would have been a long time before we did. You can't beat the laws of Mendel.

Colonel Hamilton proceeded to Berlin where he conferred with Lt. Gen. Lucius Clay, Deputy Military Governor of the American Sector, and discussed the entire matter with him. Colonel Hamilton then proceeded to the German Government thoroughbred breeding farm at Altefeld. The German Government established Altefeld in 1934, and immediately set out to accumulate superior foundation stock there. The war gave them almost unlimited opportunity in this respect. They assembled here the stallions Phalaris, Brantome, Bubbles, Antonym, Oleander, and Flamboyant, and a band of superior mares from all over continental Europe. The Germans established here not only the best possible foundation bloodstock but their best horsemen as well. Captain Falk, the veterinarian, had been in charge of the breeding at Altefeld for ten years. This breeding farm had been kept intact throughout the war, and in September 1945 it was still a well-run farm with most of its original complement of personnel.

Colonel Hamilton then visited Monsbach and Donnauworth, where the German Army had been carrying on a breeding program for many years. Here were established not only some of the best German stock but also some bloodstock captured in Poland, and many of the horses from the Hungarian State Stud at Babolna, which was established in 1789 by the Emperor Joseph II of Austria. As the Russians pressed into Hungary, the Germans evacuated the Babolna Stud to Germany proper.

After more than a month of looking at horses and selecting the better bloodstock for return to the United States, Colonel Hamilton completed arrangements for the shipment of 152 horses, consisting of sixty-four Thoroughbreds, forty half-breds, twenty-three Arabs, fifteen Arab Kinds, nine Lippizzaners, and one Russian horse.

The horses fall into two categories: First, those which were captured from the Axis armies and, as such, are legitimate prizes of war, in accordance with the Rules of Land Warfare and the Hague and Geneva Covenants. (In this connection it is interesting to note that one of the foundation sires of the great English Thoroughbred was Byerly Turk, captured by the British Captain Byerly in the Turkish war mentioned earlier in this story.) Second, those which were requisitioned by our occupation forces from the German Government and/or from private German breeders. Those horses which we requisitioned were appraised and accepted for subsequent inter-Allied reparation settlements in accordance with the Potsdam Agreement.

After days of tedious rail shipments to the Port of Bremerhaven, the horses were loaded on a lightly ballasted Liberty ship, and for twenty-one days they battled one of the worst storms of the North Atlantic. On one occasion several of the horses were thrown completely out of their stalls and out on the deck in a heap. Naturally they were a pretty sad sight when they arrived. That none were lost or permanently injured is a real tribute to the horsemanship of the six officers and seventy enlisted men who accompanied them.

The ship docked at Newport News, Virginia, in October 1945, and the horses were unloaded and shipped by rail to the Aleshire Quartermaster Depot (Remount), Front Royal, Virginia, where they went into strict quarantine. All during the winter and early spring they were conditioned, and were not shown to the public until April 7, 1946. At that time an exhibition of these horses was held before a crowd of several thousand visitors, including some of the best known and most distinguished horse-breeders of America.

Some of these horses are valued highly from a monetary standpoint. Their value to the Army Horse-breeding Program is so great that it cannot be measured in dollars and cents. Following is a short description of the various breeds and of a few of the better horses.

The main interest of civilian breeders, of course, lies in the Thoroughbreds, for they are the horses which are eligible for registration with the Jockey Club and for racing on the various tracks in the United States and all over the world. The top representative of this breed is Nordlicht, a five-year-old chestnut horse, for whom offers of up to $300,000 have been made. Nordlicht won the German Derby in 1944. His sire, Oleander, also won the German Derby and was an undefeated racer. These Thoroughbreds, as a whole, represent the finest bloodlines of all Europe. In their pedigrees the names of the famous stallions Oleander, Herold, Bubbles, Janitor, Alchemist, Teddy, Belfonds, Brantome, Blandford, Pharis, Pharos, Flamboyant, Tracery, Blenheim, Manna, Mannamead, Swynford, Phalaris, and Fairway appear again and again. In addition to Nordlicht, Athanasius, who also won the German Derby, Konig Laurin, an ex-steeplechaser, Tagfalter, and Taj Akbar, who formerly belonged to the Agha Khan and was second in the Epsom Derby, were brought to this country.

Also included in the shipment were twenty-three Arabian horses, bred in the Polish Stud in Janow and in the Hungarian State Stud in Babolna. The origin of the Arabian breed has been the subject of much romantic invention. As a matter of fact, existence of the horse in Arabia proper is of comparatively recent date, the best horses of earlier times having been in middle Asia and Persia. One generally accepted version of the origin of the foundation stock of Arabians is the report that a tribe in flight from Mecca to Medina started out with ninety-five mares, only five of which reached Medina alive, and that these five were the foundation stock of the Arabian breed. The fact that one of the primary qualities of the Arabian horse is his endurance lends credence to this report. There are not a great many directly descended Arabian horses in the world —probably less than 30,000. The two best Arabians brought over in this shipment were Lotnik and Witez II. Lotnik is an eight-year-old grey horse, by Opal out of Mokka. He was bred in Poland and brought to Germany by the German Army as a yearling. The Germans felt, and horsemen of this country are inclined to agree, that he is one of the finest Arabian stallions in the world. He is both a nice horse and a good horse, having the quality, performance, style, and temperament that you hope to see in a nice horse, and the spirit and durability that characterize a good horse. Witez II, an eight-year-old brown horse, by Ofir out of Federacja, was bred in Poland and brought to Germany as a yearling by the German Army to be installed in their newly organized Arabian Stud. His sire, Ofir, represents one of the most popular Arabian lines. In the ten generations of his pedigree there appear eleven desert-bred horses, among them his grandsire, Kuhailan-Haifi.

Fifteen Arab.Kinds were included in this shipment. This particular breed comes from Hungary, and through it the Hungarians have attempted to maintain the original Arabian characteristics and, at the same time, improve the size and substance. They originally imported to Hungary, in the middle of the 18th Century, Shagya, of the Koheilan breed, and many others, including Obajan, Hadbar, and Siglavy-Bagdady. The fifteen brought over are descendants of these foundation stallions. Pedigrees of these animals have been recorded since the early 1800's.

Also included in this shipment were nine Lippizzaners, bred by the Hungarian State Stud at Babolna. They originated in Lippizza on the border of Italy and Austria. They were first brought into Austria in the 16th Century and are said to have the oldest recorded stud book of any breed in the world. These horses were bred primarily for coach horses for the royal family, high school horses for the Spanish Riding School in Vienna, and stallions for the farms where more active draft horses were needed. They are all descendants of the original five stallions of the Lippizzaner breed—Favory, Conversano, Maestoso, Neapolitano, and Pluto.

The forty half-bred horses which were also included in the shipment are probably, from a strictly Remount viewpoint, the best things that we have. Because of the splendid foundation stock in Europe, the Europeans have bred very intelligently, adding a little hot blood and a little cold blood where needed until they have developed a half-bred which is just about right. Not only has their breeding been intelligent but their selection has been based entirely upon performance. They introduced half-bred racing, and all the stock passed some very strenuous racing, endurance, and performance tests before being put in the nursery. One mare named Adian won a couple of races against many Thoroughbreds. One of these races was 34 miles and 6 furlongs; she won it in 1 hour, 50 minutes, and 40 seconds, carrying almost 200 pounds. Two days later she won a four-mile race on the flat, also against Thoroughbred horses. It is horses of this type that will do much to improve the breed of riding horses in the United States when put to use through the Army Horse-breeding Program.

The U. S. Army Horse-breeding Program had its inception in 1920. During the First World War, when the Army was purchasing a large number of horses, it was discovered that there were not sufficient qualified riding horses available in the United States. In 1919 the Secretary of War appointed a Remount Board, consisting of prominent civilian horsemen and Army officers, for the purpose of making a study and recommendations concerning this lack of good riding horses. The Department of Agriculture was carrying on a small breeding program with about thirty stallions throughout the country. The Remount Board recommended that the Army take over these stallions and expand the program to supply sufficient riding horses for civilian horsemen and for the Army's use in case of need. In the twenty-five years since the Program's inception the Army increased the number of stallions to a peak of

Nordicht, superb five-year-old stallion. He is one of the many splendid animals at Front Royal.

over 700, and at the present time has 500 stallions scattered throughout the United States with civilian agents in small communities.

The stallions imported from Europe will be of inestimable value in furtherance of the Army Horse-breeding Program, and the mares will be placed in the brood mare bands in the various remount depots for the purpose of producing additional stallions to carry on the Program.

The Thoroughbreds remain at Aleshire QM Depot (Remount), Front Royal, Virginia, pending completion of their registration with the Jockey Club; the Arabs and Lippizzaners have been shipped to the Pomona QM Depot (Remount), Pomona, California; the half-breds have been shipped to the Reno QM Depot (Remount), Fort Reno, Oklahoma; and the Arab Kinds were split between Pomona QM Depot (Remount) and the Reno QM Depot (Remount). The majority of the stallions were used in the studs of these depots this year, and next spring will go out with agents to further the Army Horse-breeding Program to improve the breed of riding horses throughout the United States—a project which has met with the complete approval of the American ranchmen and breeders.

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CAVALRY LEADERSHIP TESTS TO BE RENEWED IN 1947

Armored Cavalry units will renew competitive tests in 1947 to develop leadership in platoons, it has been announced by General Jacob L. Devers, Commanding General, Army Ground Forces. Competition in 1947 will be restricted to units stationed in the continental United States.

These tests were instituted in 1928 when an anonymous donor gave $35,000, the income from which was to be expended on prizes and awards to encourage and promote cavalry leadership. They had to be abandoned at the outbreak of war in 1941.

The test will be divided into four parts, each part weighted as follows:

(1) Army Ground Forces Physical Fitness test, one-sixth.
(2) Disciplinary record of platoon, one-sixth.
(3) Army Ground Forces Platoon Combat Firing test, one-third.
(4) A tactical motorized march of more than two hours, bivouac and night movement to an attack position, inspection of clothing, equipment and clothing, one-third.

Three prizes will be awarded in 1947. Two will go to the Second Armored Division and the third will go to the Third Cavalry Group (Mechanized).

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The new Tables of Organization for the Armored Division call for an increase in the tank strength from 265 to 400 (increase to be in medium and heavy tanks), increased fire power, and an increase in personnel from 11,000 to nearly 15,000 officers and men. The new Armored Divisions will include addition of a battalion of heavy artillery, and there will be four infantry battalions instead of three as at present, with a company of infantry added to each battalion. Under the new organization, the Armored Division will have a strength of 16 rifle companies instead of nine, as at present.

The new organization will be equipped with approximately 50 light tanks for reconnaissance purposes and three battalions of medium tanks—improved General Sherman tanks (35 tons) to be armed with 76mm guns.

Added to the new Armored divisional organization will be another battalion of General Pershing tanks to be employed in assault operations. These heavy tanks, which weigh between 45 and 50 tons, will be armed with 99mm guns. The new organization will also provide for an increase in medium artillery.—*Army and Navy Register.*

CARDED

The New National Guard

by Major General Butler B. Miltonberger[*]

A NEW National Guard program is in the making in connection with the plans for the postwar military establishment. Our objective will be to keep secure the peace for which our armies fought. From the many lessons learned in this recent war the most outstanding is that preparedness is the keynote of military policy. The maintenance of a Regular Army alone will not provide this preparedness. The National Guard, organized and ready for immediate mobilization at the order of the Commander in Chief, will provide the first lines of defense if ever again we are threatened by another world conflict.

The National Defense needs of the United States require a broader dissemination of knowledge of military affairs, tactics, and technique through the rising generations of manpower than has ever been necessary before. I am strongly of the opinion that the best solution remains with some form of universal military training under Federal auspices with a close integration of that program with the civilian components of the Army and Navy.

The present authorization of troops by the War Department for the National Guard totals 682,000 including 620,000 Ground Force troops, 58,000 Air troops, and 4,000 for the Headquarters and Headquarters Detachments, which provide the administrative personnel in the offices of the Adjutants General of the States.

The Ground Force troops include 25 Infantry Divisions, two Armored Divisions, and considerable numbers of Antiaircraft Artillery, Armored Cavalry, Engineers, Field Artillery, Medical, Ordnance, Quartermaster, Tank, and Signal troops. Of the total authorized Ground Force troops all except 57,102 have been officially accepted by the Governors of the States.

It has been decided that, by and large, the new National Guard will initially be a veteran force. The officers holding posts in this force will be required to have performed efficiently in wartime federal service in the same positions or in positions of "corresponding and equal responsibility" to those to which they are appointed in the new National Guard.

But what of the enlisted men? Particularly, what of the noncommissioned officers?

A year ago this summer it began to be certain that the war was nearly over. We would want to use our war veterans to form the new National Guard. As the officers would come home, they would, under standing provisions of law, still retain their old "recognitions" in their old units. All enlistments would, however, have expired. The enlistment in the National Guard of a State is for three years. The induction was in 1940 and 1941. Those enlistments expired while the guardsmen were in federal service. A year ago we had no enlisted men in the National Guard at all, not even the returned soldiers to use as a nucleus.

So in August, 1945, we attacked the problem. The result was a circular issued in September, 1945, to permit the resumption of enlistments in the National Guard. Only men who had completed their federal service could be enrolled.

Then the Japanese surrendered. The War Department determined in October new over-all policies for the new National Guard. A plan for organization was prepared. Money was provided in appropriation acts of Congress. Equipment and supplies were provided. Training provisions were sketched. But still we had no soldiers.

This summer we were ready to go ahead, but it was a difficult problem. The war is even yet not over and Selective Service is still taking men for the army, although now between the ages of 19 and 29 only. The Recruiting Service is still enrolling people. We would be in competition with them for personnel. But finally the matter was settled.

The National Guard would start recruiting. It would have no prior claim on men eligible for induction through Selective Service. Those who had not helped in the war effort and who were eligible for the draft owe their first duty to the occupation forces. We would take veterans and would fill the first few low percentages of our strength from those who were experienced soldiers. We could take in some 18-year-olds not yet eligible for induction and season them but would release them to the draft when they would be called for Selective Service. The veterans would break these men in right, and would give them their first introductions to military affairs in the familiar surroundings of a home-town unit, with home-town support.

This procedure will give us two things: First, it will give us a seasoned backbone for the postwar National Guard and second, it will introduce the National Guard as a home-town force to the younger generation growing up.

Next to the Regular Army there will be no larger organized military force than the National Guard. We are aiming at a target strength of 514,000 to be reached within the next two years. This organized force is going to be ready to fight any place in the world under any combat condition.

We have enlarged the over-all troop basis two and a half times compared to what it was in 1940. We are going to train our National Guard the same as the Regular Army and we are going to employ the latest developments in warfare to their best advantage. Radar, the target-seeking missile, the jet-propelled plane, and the proximity fuse will add to our National Defense and will be used by the National Guard in providing that defense.

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[*] Chief, National Guard Bureau.

We are going to train harder than ever before. That two-week field period must be two weeks of hard work and intensive training. But to make this training pay off we need leadership. We prefer for a time war veterans. We need them for our noncoms and for our officers. All of our plans revolve around the experienced leadership that can be trained into the National Guard by men who have that experienced leadership to start.

Upon receipt of the original National Guard troop basis of 572,000 the National Guard Bureau prepared a study allotting to each State, Hawaii, Puerto Rico, and the District of Columbia, the equitable share of troops based upon the military manpower of the State and also based upon a desire to provide a balanced force in each of the various parts of the country. We looked carefully into the facts as to what units, especially what types of units, had been furnished by the States for the induction of 1940 and 1941. We did this partly on account of the question of armory facilities because, as you well know, an artillery unit with specially heavy arms and equipment needs stronger floors and structure for its armories than a lightly equipped Infantry unit. We also were thinking that the localities from which the former units were drawn would very likely have a reservoir of war trained personnel for units of those types. But we were principally thinking of preserving, in so far as possible, the historical continuity of the units of your States.

The particular problem before us at this minute is to conform to the over-all needs for the National Defense as now presented and still not break the historical continuity of the units which the States furnished the National Government in 1940 and 1941. We have been in consultation with the Historical Section of the Army War College upon this subject and we have been assured that a little care in the administrative handling of the reorganization will definitely preserve unit histories. It may be understood that the units which the States furnished to the Federal Government upon induction have been returned to those States in accordance with the provisions of Section III of the National Defense Act, and that when the Governors agree to a change in allotment they have had those units in their hands and are agreeing not so much to surrendering them as to changing their character. Consequently, when they issue orders for the reactivation and reorganization of the National Guard of the States, they can preserve unit histories by having the orders read that the old unit is redesignated as the new unit.

Cavalry and armored units in the new schedule of National Guard troops will be quite different from those of the past. Prior to the war we had two cavalry divisions (in addition to several other cavalry units) and we had a tank company in each of the old square-type infantry divisions. These were all reorganized between 1939 and 1942.

Now there will be no horse cavalry units at all. There will be a mechanized cavalry reconnaissance troop in each of the 25 infantry divisions. There will be other mechanized cavalry as follows:

California: 39th Cavalry Group with the 109th and 118th Reconnaissance Squadrons.
Illinois: 106th Cavalry Reconnaissance Squadron.
Idaho: 114th Cavalry Reconnaissance Squadron.
Iowa: 113th Cavalry Reconnaissance Squadron.
Massachusetts: 211th Cavalry Reconnaissance Squadron.
Missouri: 108th Cavalry Reconnaissance Squadron.
New Jersey: 102d Cavalry Group with the 102d and 117th Reconnaissance Squadrons.
New York: 101st Cavalry Reconnaissance Squadron.
Ohio: 107th Cavalry Reconnaissance Squadron.
Pennsylvania: 104th Cavalry Reconnaissance Squadron.
Texas: 56th Cavalry Group with 112th and 124th Reconnaissance Squadron.
Wyoming: 115th Cavalry Reconnaissance Squadron.

The total nondivisional cavalry strength in the new National Guard will total 609 officers, 45 warrant officers, and 9,402 enlisted, or an aggregate of 10,143.

There will be two complete armored divisions, the 49th in Texas and the 50th in New Jersey. Including these divisions there will be armored units which will total 1,356 officers, 98 warrant officers, and 17,803 enlisted, or an aggregate of 19,257. The nondivisional armored troops now allotted include:

Arkansas: 206th Tank Battalion.
California: 199th Tank Battalion.
Colorado: 193d Tank Battalion.
Georgia: 190th Tank Battalion.
Idaho: 200th Tank Battalion.
Indiana: 134th Tank Battalion, 299th Armored FA Battalion.
Iowa: 634th Tank Battalion.
Kansas: 635th Tank Battalion, 161st and 154th Armored FA Battalion.
Kentucky: 192d Tank Battalion.
Louisiana: 773d Tank Battalion.
Massachusetts: 177th Tank Battalion.
Michigan: 188th Tank Battalion.
Minnesota: 194th Tank Battalion.
Mississippi: 198th Tank Battalion.
Missouri: 196th Tank Battalion.
Nebraska: 195th Tank Battalion.
New Jersey: 695th and 696th Armored FA Battalions.
New York: 24th and 171st Armored Group with 116th, 180th, 801st, 802d, and 827th Tank Battalions.

Ohio: 107th Armored Group with 185th and 637th Tank Battalions, 987th Armored FA Battalion.
Pennsylvania: 172d Armored Group with 181st, 628th, and 629th Tank Battalions, 176th and 967th Armored FA Battalions.
Tennessee: 173d Armored Group with 183d, 775th, and 765th Tank Battalions.
Utah: 145th Armored FA Battalion.
Virginia: 182d Tank Battalion.
Washington: 652d Armored FA Battalion.
West Virginia: 197th Tank Battalion.
Wyoming: 300th Armored FA Battalion.

Other continuing studies that must be resolved in the immediate future deal with personnel, supply, and fiscal requirements.

In considering officer personnel policies, I will limit my discussion primarily to an interpretation of the requirements which have been established for initial procurement. Our War Department Policies establish a basic requirement for procurement of officers in the initial reorganization which limits initial procurement above the grade of second lieutenant to those officers who have served honorably in active Federal service in the Armed Forces for at least six month since 7 December 1941 and who, during that period, demonstrated their qualifications by actual service in the grade and position contemplated, or by satisfactory discharge of duties of corresponding and equal responsibility. The restriction limits selection of officers to certain groups. First, there is the group consisting of our National Guard officers who retain Federal recognition, some of whom are now under State control and some still in active Federal service. These officers constitute an immediate problem for the State, since they must either be absorbed in the reorganized National Guard or transferred to the Officers' Reserve Corps. These National Guard officers should be utilized to the fullest possible extent provided that they meet age-in-grade and physical requirements for continued recognition. Since reassignment will in many cases involve a change in grade, or arm or service, many of them will be required to appear before a board for examination as to their qualifications for the new assignment. This is sound procedure and I might suggest that it be followed in the case of all of these officers. Vacancies may be retained for those officers who are still in Federal service. Our phasing plan provides for this contingency since only 25 per cent officer personnel is necessary for recognition of a unit.

The War Department has recently lowered the age for enlistment in the Regular Army to 17 years by virtue of a special statute. War Department Policies state that National Guard enlistment standards will be the same as those provided for the Regular Army including the age qualifications. But we cannot make this change yet. We are still bound by the old law, that is by Section 58 of the National Defense Act, which still says, "not less than 18 years." The National Guard Association has made a definite suggestion for such an amendment.

The law permits the enlistment of men up to the age of 45. The Approved Policies restrict the age for original enlistment to 35, because that is now the War Department's upper limit for the Regular Army. Indeed, the age limits of 18 to 35 were those specifically mentioned elsewhere in the Approved Policies in blueprinting the new National Guard. I think we will get the young and vigorous men we want for an M-Day force if we hold to the lower limit of 35, men for our senior noncoms.

As for the supply plan of the National Guard it is the responsibility of the War Department to procure by purchase within the limits of appropriations made by Congress and to issue from time to time, upon requisition of the Governors, such material, clothing, and equipage as may be necessary to arm, uniform, and equip the National Guard for field service. Federal property will be issued within the limits of available appropriations on the basis of Tables of Organization and Equipment prepared by the War Department.

Before equipment is issued, the National Guard units to which equipment is to be issued must be Federally recognized or the State must accept for immediate activation a portion of the National Guard Troop Basis allocated to the State. No unit will be Federally recognized until the State has provided adequate and suitable facilities for the unit to store and care for Federal property. Determination as to the adequacy of such facilities is made by the Secretary of War. A State cannot be relieved from responsibility of Federal property issued to it which becomes lost, stolen, destroyed, damaged, or unserviceable unless it is clearly shown that reasonable precautions to care for and safeguard the property were carried out; that loss, damage, or destruction came about unavoidably through the fault or neglect of no one; and that the unserviceability resulted from fair wear and tear in the service.

In so far as supply is concerned, the State Headquarters is comparable to an Army Headquarters. The U. S. Property and Disbursing Officer, who is a member of the State Headquarters, is comparable to the station supply officer. The National Guard will be supplied from the same sources and use the same procedures that apply to the Regular Army in the Zone of Interior. The initial shipment of equipment and supply will be a fraction of the total authorized for the full strength organization and will be based upon actual requirements for meeting the training program.

When looking into the maintenance requirements for the National Guard, we find the same factors that apply to any military maintenance problem. The various Tables of Organization will give us the details of organizational equipment; the training program will give us information on which to estimate the usage of this equipment; the mission of the National Guard demands that the equipment be in constant readiness for combat use.

We have three classes of maintenance—organizational, field, and base. The organizational and field maintenance will be the responsibility of the Guard itself within various States. Base maintenance will be a responsibility of the Technical Services. In comparison with the prewar situation, the Guard will have a greater quantity of increasingly complex equipment. Responsibility for organizational maintenance is within command channels and each organization and unit commander has his definitely fixed responsibilities.

In recognizing the limitations put on unit maintenance provision is made for unit caretakers. This unit caretaker will be classified as a matériel and maintenance mechanic and will be a full-time employee. He will be required to be a member of the Guard and of the unit concerned. In addition to having custody of the equipment and property of the Unit, he will perform unit organizational maintenance, within his capacity, under direction of the unit commander. In units, such as tank companies and artillery batteries, when the amount of equipment in the hands of the unit is such that the maintenance load is beyond the capacity of one caretaker, we expect to authorize additional caretakers.

We have in the troop basis a certain number of service troops. There are, of course, the divisional service troops in each of the divisions. In addition to these units, we have 11,000 ordnance troops, nearly 8,000 signal troops. In addition to the necessity for having all equipment for the Guard continuously in combat serviceable condition, we must also have these service troops at a high degree of readiness if our Guard units are to be effective in sustained combat. It is obviously impossible for these service units to perform any appreciable part of the required field maintenance during their authorized weekly drill period.

We have a provision in the law for the establishment of caretaker pools. We intend to use this authorization to establish in our service units the necessary number of maintenance pools to meet our responsibility for field maintenance. In general, these maintenance pools will be composed of members of the Guard service units employed on a full-time basis at mechanics' wages. We will utilize the Army technical schools for training these individuals to the extent required. Our current budget estimate provides for an adequate number for the fiscal year, 1947. The exact number to be required in the future will depend upon experience. In ordnance maintenance units, we may have up to 20 per cent of certain organizations on this full-time duty. In carrying out maintenance operations, they will utilize organizational equipment furnished to units and will replenish basic loads of supplies and spare parts by requisition. It is obvious that fully qualified service units will be the result of this system.

Funds appropriated for the support of the National Guard will provide the salaries for all caretakers and reimbursement for supplies.

In addition to supply and maintenance responsibilities, it has been necessary for the National Guard Bureau to take the lead in establishing a firm installations and facilities program. In the National Guard policies, we have already stated that "The States will furnish the personnel, adequate armories, and storage facilities." The United States will supervise instruction and will furnish outdoor training facilities, pay, and all uniforms, equipment, and ammunition.

The interpretation was made that armories and related facilities for local use of the troops would be a State responsibility, and that the summer training camp would definitely be a Federal responsibility. There is an in-between matter of rifle ranges, week-end training sites, and other similar facilities, but this will have to be worked out as we go along. It was necessary to present specific cases to G-4 for definite reaffirmation of our concept of this approved policy. The following policy announcement resulted: "The facilities selected for summer training of the National Guard will be retained under Federal control in accordance with approved War Department policy. Necessary instructions have been issued to the Commanding General, Army Service Forces, to hold the post, camp, and station property necessary for the summer training of the National Guard and to provide necessary fire protection."

Based upon the proposed allocation of troops, which was submitted to the States, a total of 31 stations and 18 harbor defense installations have been approved by the War Department for the summer training of the entire Ground Forces of the National Guard. It is anticipated, at this time, that the Air units will do their summer training, in general, at their home Air Bases. The approved camps, except harbor defense installations, in some cases, cannot accommodate the entire Guard allotted at one time. It is obvious that for these stations the training periods must be phased. It is, however, intended that complete divisions, wherever they are organized, will train at summer encampments as a unit.

The unprecedented size and scope of the postwar National Guard under the approved troop basis has presented a major budgeting problem to the National Guard Bureau. The 1947 Budget is the largest budget estimate ever submitted for Federal appropriation to support the National Guard. Definite assumptions had to be made to form a basis from which to build the estimate. These assumptions included that activation of the National Guard would be early this year, that the attained strength as of June 1947 would be 240,000 officers and enlisted men, and that 72,000 of these would engage in field training at the end of the fiscal year 1947.

Book Reviews

THE ADMIRALTIES. Historical Division, War Department. Printed by Government Printing Office. 40¢.

The first Cavalry Division and its conquest of the strategically important Admiralty Islands is the subject of this 150-page book published in October by the Historical Division of the War Department.

This is the eighth in a series of historical reports published by the Historical Division to be followed by others on all phases of World War II.

Every phase of the Admiralties campaign is covered in this interesting little book, from the assault on Los Negros and the battle to hold that beachhead, the control of Seeadler Harbor, the attack on Manus Island, the landing at Lugos Mission, the capture of Lorengau airdrome, to the capture of the outlying islands—Pitylu, Koruniat, Ndrilo and Rambutyo.

With an initial force of 1,000 men to the enemy's 4,300, the landing force not only overwhelmed the enemy but exacted a vastly disproportionate number of casualties from the defenders. Against American losses of 326 killed, 1,189 wounded and four missing, Jap casualties were estimated at 3,280 killed and 75 missing, an approximately 10-to-1 ratio.

The actions of men and individual units are described in detail in this book. Names of outstanding First Cavalry Division soldiers are on practically every page.

This is a book that every present and former member of the First Cavalry Division will want to own. It is also a book for everyone as it tells the story of one of the hardest fought campaigns in World War II.

It is highly recommended reading.

* * *

INCENDIARY WARFARE. By Colonel George J. B. Fisher. The McGraw-Hill Book Co. $3.00.

Here is a book that tells in as simple a way as possible the sequence of events leading up to an explosion, the phenomena produced, and the effects of these phenomena on the surroundings. It describes the destructiveness of the bombs and shells in warfare, and the effects of the accidental explosions in munition plants and elsewhere. Clear, concise, up to date, the book gives data on 125 notable explosions and charts, practical graphs of the damage from these actual charges.

Introduction to this book of 125 pages is written by Major General Alden H. Waitt, Chief of the War Department Chemical Warfare Service. In his three-page introduction General Waitt states "The contribution to victory by incendiaries was a tremendous one."

This book is recommended reading for all those interested in bombs and their effect.

THE MONASTERY. By F. Majdalany. Houghton Mifflin Co. $2.00.

World War II was remarkable for the severity, the impact, often the brevity, of its isolated engagements and campaigns. Of these none was more violently concentrated than the classic attack on Monte Cassino which resulted in the capture from the Germans of the symbolic Monastery founded by St. Benedict in the Sixth century.

This book, written by a British officer who took part in the fight to capture Monte Cassino, is a personal narrative of war well worth reading. It is the story of fighting men written by one.

* * *

ALL BUT ME AND THEE. By Brigadier General Elliot D. Cooke. Infantry Journal Press. $2.75.

General Cooke has written a powerful and important book. It is certainly must reading for every military reader.

It is the first book written for laymen by a layman that gives a clear and understandable picture of psychiatric cases in the army. Psychiatric cases cost us hundreds of thousands of fighting men at times when fighting men were at a premium, millions of dollars while school children were being urged to buy defense stamps instead of candy, and tens of thousands of hospital beds when other patients were being turned away.

Why are there so many of them? What will the United States do about it? What is wrong with these men? Are they salvable? Total losses? Can they get along in civilian life? Are we handling them right? General Cooke does a creditable job of answering these questions and hundreds more.

* * *

MOUNTAIN PONY. By Henry V. Larom. Illustrated by Ross Santee. Whittlesey House. $2.00.

This is a rousing present-day adventure story for all boys and girls who like horses and outdoors.

Andy Marvin, soon after his arrival in Wyoming, buys a sorrel pony from a man who is abusing it. Although Andy is bucked off, run away with and subjected to all the mischievous tricks a Western pony can think of, he gradually tames tough little Sunny. Eventually they become inseparable companions.

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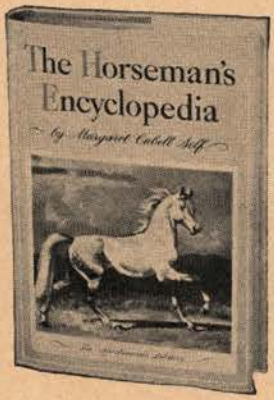

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JEEPS IN THE SKY. By Lieutenant Colonel Andrew Ten Eyck. Commonwealth Books, Inc. $3.00.

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WHITE HOUSE PHYSICIAN. By Vice Admiral Ross T. McIntire. G. P. Putnam's Sons. $3.00.

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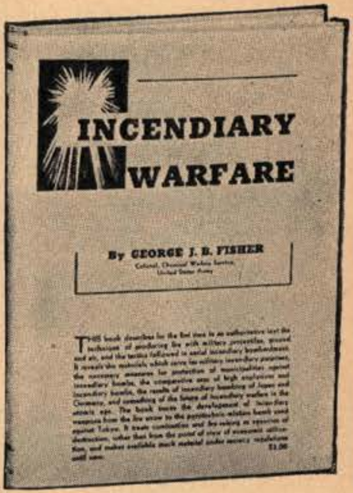
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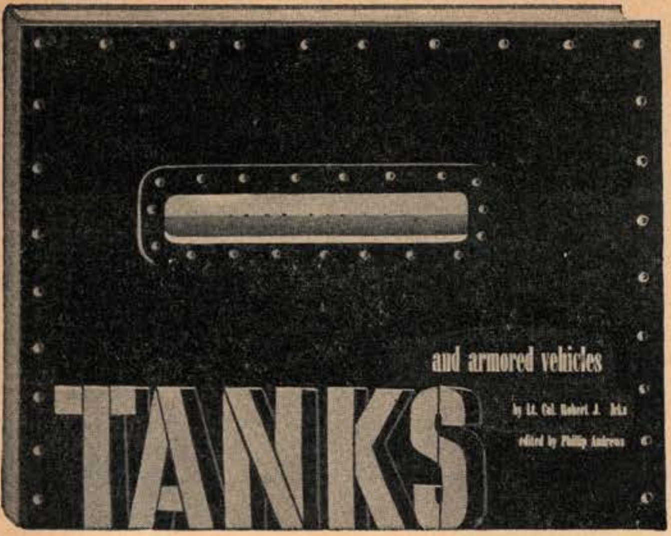

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